

**Alligator Point Beach Restoration and Beneficial Use of
Dredged
Material from the
Apalachicola River, Franklin County, Florida**

**Biological Opinion
May 10, 2004**

**Prepared by:
U.S. Fish and Wildlife Service
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May 10, 2004

Colonel Robert B. Keyser
District Engineer
Mobile District, U.S. Army Corps of Engineers
P.O. Box 2288
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Attn: Coastal Environment Team
Planning and Environmental Division (Larry Parson)

Re: FWS Log No. 4-P-02-163
Date Started: November 19, 2003
Applicant: Corps of Engineers, Mobile District
Project Title: Alligator Point County Road 370
Protection
Location: Alligator Point
Ecosystem: NE Gulf
County: Franklin County, Florida

Dear Col. Norwood:

This document transmits the Fish and Wildlife Service's (Service) biological opinion on the beach restoration and beneficial use of Apalachicola River dredged material to protect County Road (CR) 370 in Franklin County, Florida, and the effect on nesting sea turtles. The Service concurs that the proposed action would not likely adversely affect Gulf sturgeon (in fresh water), bald eagle, manatee, or wintering piping plover or adversely modify designated critical habitat for the Gulf sturgeon (in fresh water) or the wintering piping plover. This opinion is provided in accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*)

INTRODUCTION

This biological opinion is based on information provided in the biological assessment (BA) dated October 20, 2003, later information provided by Corps of Engineers Planning and Environmental Division staff (Corps), discussions with Corps staff, and onsite observations. A complete administrative record of this consultation is on file at this office.

CONSULTATION HISTORY

<u>April 2001</u>	Report entitled: Hurricane Evacuation Route & Beach Management Alligator Point/Bald Point Feasibility & Design is issued by Franklin County, Florida Department of Protection (FDEP), and Federal Emergency Management Association (FEMA).
<u>May 8, 2002</u>	The Mobile Corps issues public notice FP02-AP01-11 for the project.
<u>May 30, 2002</u>	The Service submits to the Corps, a comment letter on the public notice relative to sea turtles and bald eagles.
<u>December 18, 2002</u>	The Service attends a meeting about the Alligator Point Shoreline Protection Study.
<u>January 29, 2003</u>	The Service provides a letter to the Mobile Corps with comments subsequent to the December meeting.
<u>November 19, 2003</u>	The Corps requests the Service to initiate formal consultation for the project. A Biological Assessment (BA) on the project is included.
<u>December 8, 2003</u>	The Services sends the Corps a letter acknowledging and concurring with the request for formal consultation.
<u>February 9-13, 2004</u>	Various e-mails are exchanged between the Service and the Corps concerning the project related to the project extent, dune creation, design profile, and sea turtle surveys.

BIOLOGICAL OPINION

Description of the Proposed Action

The Corps proposes to restore a beach and dune system at Alligator Point through the use of dredged material stored in an upland disposal area along the Corley Slough reach of the Apalachicola River. The beach and dune will be constructed along the existing rock revetment adjacent to CR 370 at the KOA Campground on Alligator Point. Approximately 200,000 to 300,000 cubic yards of sand will be placed on an annual basis depending upon river conditions being conducive to access the disposal area and transport the material, availability of funding, and behavior of subsequently placed material at the project site. The disposal areas that will be used are all located within the Corley Slough reach on the Apalachicola River between mile markers 35 and 37 and include disposal areas 38, 38A, 39, 40, 41, and 43 and any material that has previously been transported from the Corley Slough disposal areas and stockpiled at other locations.

The method of placement for this action involves loading the material from the disposal areas or storage facility onto river barges and floating the material to an approved docking facility with the capability to adequately accommodate the barges and associated activity. Three sites meet these requirements, one located in Apalachicola and two in Carrabelle. At the selected docking facility, the sand will be offloaded onto dump trucks using a clamshell crane and transported to Alligator Point and deposited on the beach. A ramp composed from the placement material will be constructed from the road to the beach allowing the trucks access to the beach. Bulldozers will be used to distribute and shape the material to the desired configuration. The project length is 2,500 feet. A portion of the project will be located seaward of an existing 1,800-foot rock revetment located on the Gulf of Mexico side of Alligator Point. The remaining 700 feet of the project will be to the east of the revetment.

County Road 370 provides the only access (and hurricane evacuation route) along Alligator Point, a peninsula about 5 miles west from Lighthouse Point at the southeast corner of St. James Island. The existing rubble revetment at Alligator Point has experienced significant damage resulting in intermittent failure of CR 370. Since the early 1970s, numerous erosion control projects have been constructed along Alligator Point to protect CR 370. Following Hurricane Alberto in 1994, the existing 1,800-foot rock revetment with concrete capping was constructed to provide additional protection to the roadway. At the time of construction, approximately 100 feet of beach was present seaward of the revetment. Coupled with the high erosion rates from storm impacts, it is believed that the revetment has contributed to the gradual and continual diminishment of the beach-dune system and associated resources that once existed at this location. At present, there is no beach along the entire reach of the structure.

The dune profile will be created to match as closely as possible the existing profile on Alligator Point. When the beach restoration and dune creation are completed the dunes will be planted with at least three species of native dune vegetation. The dune plants will cover approximately 60 to 80 percent of the total dune area on 2-foot spacings.

Conservation Measures

The Corps has proposed or implemented the following measures to minimize impacts on manatees and nesting sea turtles and hatchlings.

1. Manatee Special Conservation Conditions will be incorporated into the Project Plan.
 - 1a. All personnel associated with the project will be instructed about the potential presence of manatees and the need to avoid collisions with manatees. All construction personnel are responsible for observing water-related activities for the presence of manatee(s).
 - 1b. All construction personnel shall be advised that there are civil and criminal penalties for harming, harassing, or killing manatees which are protected under the Marine Mammal Protection Act of 1972, the Endangered Species Act of 1973, and the Florida Manatee Sanctuary act of 1978. The applicants and/or contractor may be held responsible for any manatee harmed, harassed, or killed as a result of construction activities.
 - 1c. All vessels associated with the project shall operate at “no wake/idle” speeds at all times while in water where the draft of the vessel provides less than four feet clearance from the bottom and that vessels shall follow routes of deep water whenever possible.
 - 1d. If a manatee is sighted within 100 yards of the project area, all appropriate precautions shall be implemented to ensure protection of the manatee. These precautions shall include the operation of all moving equipment closer than 50 feet of a manatee. Operation of any equipment closer than 50 feet of a manatee shall necessitate immediate shutdown of that equipment. Activities will not resume until the manatee(s) has departed the project area of its own volition.
 - 1e. Any collision with and/or injury to a manatee shall be reported immediately to the “Manatee Hotline” at 1-800-DIAL-FMP (1-800-342-5367). Collision and/or injury should also be reported to the U.S. Fish and Wildlife Service in Panama City (1-850-769-0552), northwest Florida.
2. If the project cannot be completed outside the sea turtle nesting season, the following conditions will be met.

- 2a. A daily marine turtle nesting survey to relocate nests from the project site will be conducted starting May 1 and continue until September 30 if construction is occurring.
 - 2b. Only those nests that may be affected by construction activities will be relocated. Nests requiring relocation shall be moved no later than 9 a.m. the morning following deposition to a nearby self-release beach site in a secure setting where artificial lighting will not interfere with hatchling orientation. Nest relocations in association with construction activities shall cease when construction activities no longer threaten nests.
 - 2c. Nests deposited within areas where construction activities have ceased or will not occur for 70 days will be marked and left in place unless other factors threaten the success of the nest. Such nests will be marked and the actual location of the clutch determined. A circle with a radius of ten (10) feet, centered at the clutch, will be marked by stake and survey tape or string. No construction activities will enter this circle and no adjacent construction will be allowed which might directly or indirectly disturb the area within the staked circle.
- 3. No construction activity may start until completion of the sea turtle nesting survey each day.
 - 4. It will be the responsibility of the Corps to make sure that the project area is surveyed for marine turtle activity. All nesting surveys, nest relocations screening or caging activities etc. will be conducted only by persons with prior experience and training in these activities and who is duly authorized to conduct such activities through a valid permit issued by the Florida Fish and Wildlife Conservation Commission (FWC), under Florida Administrative Code 68E-1.
 - 5. Littoral zone placement for dredged material will be placed such that it will not create a barrier to sea turtles attempting to nest or otherwise create a berm that is not suitable for sea turtle nesting.
 - 6. If the project cannot be completed outside the nesting season, then from May 1 through October 31, all project lighting will be limited to the immediate area of active construction only and will be the minimal lighting necessary to comply with U.S. Coast Guard and/or OSHA requirements. Stationary lighting on the beach and all lighting on the dredge will be minimized through reduction, shielding, lowering, and appropriate placement of lights to minimize illumination of the nesting beach and water.
 - 7. If the project is conducted from May 1 through October 31, storage of construction equipment will not be allowed on the nesting beach to minimize disturbance to sea turtle nesting and hatching activities.

8. Immediately after completion of the each fill placement event the beach will be tilled. Prior to April 15 for the next three (3) years, if placed sand still remains on the beach, the Corps will measure sand compaction in the area of restoration in accordance with a protocol agreed to by the FWC, the FDEP, and the Service to determine if tilling is necessary. At a minimum, the protocol provided under a. and b. below will be followed. If required, the area will be tilled to a depth of 24 inches. All tilling activity must be completed prior to May 1. This condition will be evaluated annually and may be modified if necessary to address sand compaction problems identified during the previous year.
 - 8a. Compaction sampling stations will be located at 500-foot intervals along the project area. One station will be at the seaward edge of the dune/bulkhead line (when material is placed in this area) and one station will be midway between the dune line and the high water line (normal wrack line).
 - 8b. At each station, the cone penetrometer (a field instrument used for determining penetration resistance of soils) will be pushed to a depth of 6, 12, and 18 inches three times. Material may be removed from the hole, if necessary, to make sure accurate readings of successive levels of sediment. The penetrometer may need to be reset between pushes, especially if sediment layering exists. Layers of hard material may lay over softer layers. Replicates will be located as close to each other as possible, without interacting with the previous hole and/or disturbed sediments. The three compaction values for each depth will be averaged to produce final station values for each depth. Reports will include all 18 values for each transect line, and the final six averaged compaction values.
 - 8c. If the average value for any depth exceeds 500 psi for any two or more adjacent stations, then that area will be tilled prior to May 1. If values exceeding 500 psi are distributed throughout the project area but in no case do those values exist at two adjacent stations at the same depth, then consultation with the FWC-Office of Protected Species Management (OPSM) and the Service will be required. If a few values exceeding 500 psi are present randomly within the project area, tilling is not required.
9. Visual surveys for escarpments along the beach fill area will be made immediately after completion of fill placement and prior to May 1, for the next three years if placed sand remains on the beach. Any escarpments that exceed 18 inches in height for a distance of 100 feet will be leveled to the natural beach contour by May 1.
10. Visual surveys for barriers formed by the sand placement will be completed prior to May 1 each year after fill placement for three years following placement of the material. Results of

the surveys will be submitted to the Service and the FWC-OPSM prior to any action being taken. Sand berms that could interfere with sea turtle movement to and from the beach or otherwise impact nesting will be leveled to the natural beach contour by May 1.

11. The Corps will arrange a meeting between the Service, FDEP, FWC-OPSM, and the permitted sea turtle surveyor(s) at least one month prior to each nesting season after to completion of this work to review turtle monitoring requirements. At least 14 days advance notice will be provided prior to this meeting.
12. Reports on all nesting activity will be provided for the initial nesting season and for a minimum of three additional nesting seasons after the sand is placed if the placed material remains. Monitoring of nesting activity in the three seasons following construction will include daily surveys and any additional measures authorized by the FWC-OPSM. Reports submitted will include daily report sheets noting all activity, nesting success rates, hatching success of all relocated nests, hatching success of a representative sampling of nests left in place (if any), dates of construction and names of all personnel involved in nest surveys and relocation activities. All reports will be submitted by January 15 of the following year.
13. Upon locating a dead, injured, or sick endangered or threatened sea turtle specimen, initial notification must be made to the FWC at 1-888-404-FWCC. Care should be taken in handling sick or injured specimens to make sure effective treatment and care and in handling dead specimens to preserve biological materials in the best possible state for later analysis of cause of death. In conjunction with the care of sick or injured endangered or threatened species or preservation of biological materials from a dead animal, the finder has the responsibility to make sure that evidence related to the specimen is not unnecessarily disturbed.

In addition to the above protective measures, the proposed sand placement is planned to be done prior to the start of sea turtle nesting season (May 1) to avoid direct impacts to nesting adults and juveniles. The Corps anticipates that conducting the work in the winter would greatly reduce the potential of incidental take to the species. Further, whenever practicable, future maintenance involving beach placement will be conducted in the winter months.

Action Area

The Action Area for this consultation consists of the Gulf beachfront on the upper Alligator Point peninsula in Franklin County (Figure 1). The Action Area is bordered on the south by the Gulf of Mexico, on the north by CR 370, on the east and west by privately owned lands and State submerged lands.

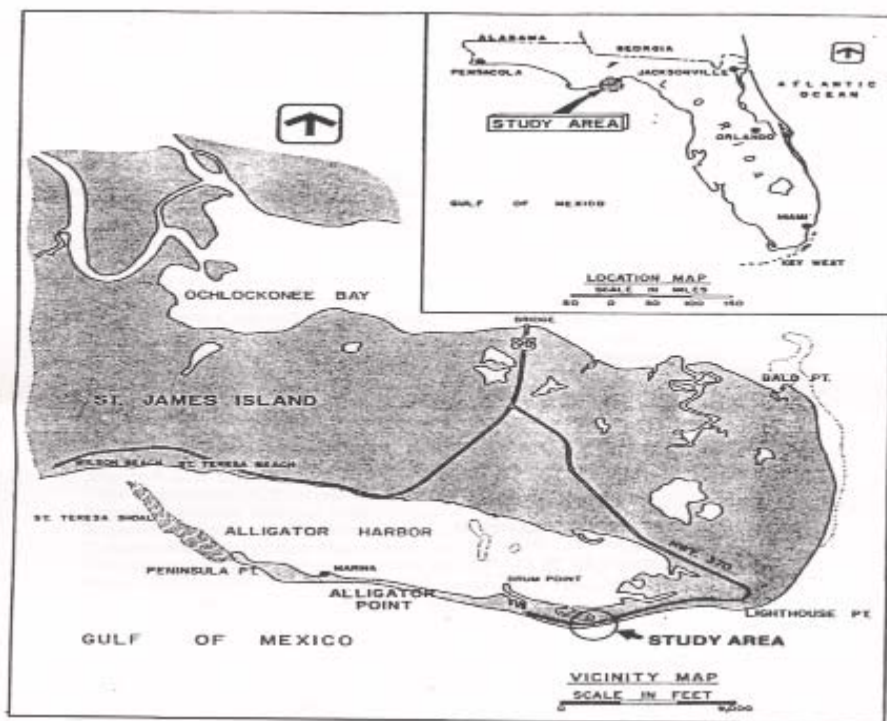


Figure 1: Location map of the beach restoration project Alligator Point, Florida, project area.

The beachfront of the project area is an undeveloped eroded shoreline abutting the coastal road and a rock revetment on the landward side. Single-family homes are found along most of the Gulf of Mexico shoreline except where the shoreline has been eroded away. Homes have been lost in this area because of the erosion. No homes or structures occur within the project area. Where sand still occurs along the shoreline, the natural communities contain substrate and vegetation that are common to coastal areas and subject to salt spray, wind, drought conditions, and sandy soils.

STATUS OF THE SPECIES/CRITICAL HABITAT

The Service has responsibility for implementing recovery of sea turtles when they come ashore to nest. The National Oceanic and Atmospheric Administration-Fisheries (NOAA-Fisheries) has jurisdiction over sea turtles in the marine environment. This biological opinion addresses nesting sea turtles and hatchlings only.

Four species of sea turtles are analyzed in this biological opinion: the threatened loggerhead sea turtle (*Caretta caretta*), the endangered green sea turtle (*Chelonia mydas*), the endangered leatherback sea turtle (*Dermochelys coriacea*), and the endangered Kemp's ridley sea turtle (*Lepidochelys kempii*).

Species/critical habitat description

Loggerhead Sea Turtle

The loggerhead sea turtle (*Caretta caretta*) was federally listed as a threatened species throughout its range in the United States (U.S.) on July 28, 1978 (43 FR 32800). No critical habitat has been designated for the loggerhead sea turtle.

The loggerhead sea turtle is characterized by a large head with blunt jaws and grows to an average weight of about 200 pounds. The loggerhead feeds on mollusks, crustaceans, fish, and other marine animals.

The loggerhead sea turtle inhabits the continental shelves and estuarine environments along the margins in the temperate and tropical regions of the Atlantic, Pacific, and Indian Oceans. Major nesting beaches are located in the Sultanate of Oman, southeastern U.S., and eastern Australia. The species is widely distributed within its range. It may be found hundreds of miles out to sea, as well as in inshore areas such as bays, lagoons, salt marshes, creeks, ship channels, and the mouths of large rivers. Coral reefs, rocky places, and ship wrecks are often used as feeding areas. Nesting occurs mainly on open beaches or along narrow bays having suitable sand, and often in association with other species of sea turtles.

Recovery Criteria for the United States

The southeastern U.S. population of the loggerhead can be considered for delisting if, over a period of 25 years, the following conditions are met:

1. The adult female population in Florida is increasing and in North Carolina, South Carolina, and Georgia, it has returned to pre-listing levels (NC - 800, SC - 10,000, and GA - 2,000 nests per season). The above conditions shall be met with the data from standardized surveys which would continue for at least five years after delisting.
2. At least 25 percent (348 miles) of all available nesting beaches (1,400 miles) is in public ownership, distributed over the entire nesting range and encompassing at least 50 percent of the nesting activity in each state.
3. All priority one tasks identified in the recovery plan have been successfully implemented.

Green Sea Turtle

The green sea turtle (*Chelonia mydas*) was federally listed as a protected species on July 28, 1978 (43 FR 32800). Breeding populations of the green turtle in Florida and along the Pacific

Coast of Mexico are listed as endangered; all other populations are listed as threatened. Critical habitat for the green sea turtle has been designated for the waters surrounding Culebra Island, Puerto Rico, and its outlying keys (50 CFR 226.72).

The green sea turtle grows to a maximum size of about 4 feet and a weight of 440 pounds. It has a heart-shaped shell, small head, and single-clawed flippers. Hatchling green turtles eat a variety of plants and animals, but adults feed almost exclusively on seagrasses and marine algae.

The green sea turtle has a worldwide distribution in tropical and subtropical waters. They are generally found in fairly shallow waters (except when migrating) inside reefs, bays, and inlets. The sea turtle is attracted to lagoons and shoals with an abundance of marine grass and algae.

Major green turtle nesting colonies in the Atlantic occur on Ascension Island, Aves Island, Costa Rica, and Surinam. Open beaches with a sloping platform and minimal disturbance are required for nesting.

Recovery Criteria for the United States

The U.S. population of green sea turtles can be considered for delisting if, over a period of 25 years, the following conditions are met:

1. The level of nesting in Florida has increased to an average of 5,000 nests per year for at least six years. Nesting data shall be based on standardized surveys.
2. At least 25 percent (65 miles) of all available nesting beaches (260 miles) is in public ownership and encompasses at least 50 percent of the nesting activity.
3. A reduction in stage class mortality is reflected in higher counts of individuals on foraging grounds.
4. All priority one tasks identified in the Recovery Plan have been successfully implemented.

Leatherback Sea Turtle

The leatherback sea turtle (*Dermochelys coriacea*) was federally listed as an endangered species throughout its range in the U.S. on June 2, 1970 (35 FR 8491). Marine and terrestrial critical habitat for the leatherback sea turtle has been designated at Sandy Point on the western end of the island of St. Croix, U.S. Virgin Islands (50 CFR 17.95). This is the largest, deepest diving, and most migratory and wide ranging of all sea turtle species. The adult leatherback sea turtle can reach 4 to 8 feet in length and weighing 500 to 2,000 pounds. Jellyfish are the main staple of its diet, but it is also known to feed on sea urchins, squid, crustaceans, tunicates, fish, blue-green algae, and floating seaweed.

The leatherback sea turtle is distributed worldwide in tropical and temperate waters of the Atlantic, Pacific, and Indian Oceans. Non-breeding sea turtles have been recorded as far north as British Columbia, Newfoundland, the British Isles, and the Maritime Provinces of Canada and as far south as Argentina and the Cape of Good Hope (Pritchard, 1992).

Leatherback sea turtles nest on shores of the Atlantic, Pacific, and Indian Oceans. Adult females require sandy nesting beaches backed with vegetation and sloped sufficiently so the distance to dry sand is limited. Their preferred beaches have proximity to deep water and generally rough seas.

Recovery Criteria for the United States

The U.S. population of leatherback sea turtles can be considered for delisting if the following conditions are met:

1. The adult female population increases over the next 25 years, as evidenced by a statistically significant trend in the number of nests at Culebra, Puerto Rico, St. Croix, U.S. Virgin Island, and along the east coast of Florida.
2. Nesting habitat encompassing at least 75 percent of nesting activity in U.S. Virgin Islands, Puerto Rico, and Florida is in public ownership.
3. All priority one tasks identified in the recovery plan have been successfully implemented.

Kemp's Ridley Sea Turtle

The Kemp's ridley sea turtle (*Lepidochelys kempii*) was listed as endangered on December 2, 1970 (35 FR 18320). The range of the Kemp's ridley includes the Gulf coasts of Mexico and the U.S., and the Atlantic coast of North America as far north as Nova Scotia and Newfoundland.

Most Kemp's ridleys nest on the coastal beaches of the Mexican states of Tamaulipas and Veracruz, although a very small number of Kemp's ridleys nest consistently along the Texas coast (Turtle Expert Working Group, 1998). In addition, rare nesting events have been reported in Florida, Alabama, South Carolina, and North Carolina. Hatchlings, after leaving the nesting beach, are believed to become entrained in eddies within the Gulf of Mexico, where they are dispersed within the Gulf and Atlantic by oceanic surface currents until they reach about 7.9 inches in length, at which size they enter coastal shallow water habitats (Ogren, 1989). Outside of nesting, adult Kemp's ridleys are believed to spend most of their time in the Gulf of Mexico, while juveniles and subadults also regularly occur along the eastern seaboard of the United States (U.S. Fish and Wildlife Service and National Marine Fisheries Service, 1992).

No critical habitat has been designated for the Kemp's ridley sea turtle.

Recovery Criteria for the United States

The goal of the Recover Plan for the Kemp's Ridley sea turtle is to downlist the species from endangered to threatened status. The Recovery Team members feel that the criteria for a complete removal of this species from the endangered species list need not be considered currently but rather in the future. Complete removal from the Federal list would certainly necessitate that some other instrument of protection, similar to the Marine Mammal Protection Act, be in place and be international in scope. Kemp's ridley can be considered for downlisting to threatened under the ESA if the following four criteria are met:

1. Protection of the known nesting habitat and the water adjacent to the nesting beach (concentrating on the Ranch Nuevo area) and continuation of the bi-national project,
2. Elimination of the mortality from incidental catch from commercial shrimping in the U.S. and Mexico through the use of Turtle Excluder Devices (TEDs) and full compliance with the regulations requiring TED use,
3. Attainment of a population of at least 10,000 females nesting in a season,
4. All priority one recovery tasks in the recovery plan are successfully implemented.

Life history (growth, life span, survivorship, and mortality)

Loggerhead Sea Turtle

Loggerheads are known to nest from one to seven times within a nesting season (Talbert *et al.*, 1980; Richardson and Richardson, 1982; Lenarz et al., 1981; among others); the mean is about 4.1 times (Murphy and Hopkins, 1984). The interval between nesting events within a season varies around a mean of about 14 days (Dodd, 1988). Mean clutch size varies from about 100 to 126 eggs along the southeastern U.S. Coast (NMFS and Service, 1991a). Nesting migration intervals of two to three years are most common in loggerheads, but the number can vary from one to seven years (Dodd, 1988). Age at sexual maturity is believed to be about 20 to 30 years (Turtle Expert Working Group, 1998).

Green Sea Turtle

Green turtles deposit from one to nine clutches within a nesting season, but the overall average is about 3.3 clutches. The interval between nesting events within a season varies around a mean of about 13 days (Hirth, 1997). Mean clutch size varies widely among populations. Average clutch

size was 136 eggs in 130 clutches for one beach in Florida (Witherington and Ehrhart, 1989). Only occasionally do females produce clutches in successive years. Usually two, three, four, or more years intervene between breeding seasons (NMFS and Service, 1991b). Age at sexual maturity is believed to be about 20 to 50 years (Hirth, 1997).

Leatherback Sea Turtle

Leatherback sea turtles nest an average of five to seven times within a nesting season, with an observed maximum of 11 (NMFS and Service, 1992). The interval between nesting events within a season is about nine to ten days. Average clutch size reported on one beach in Florida is 101 eggs (Martin, 1992). Nesting migration intervals of two to three years were observed in leatherback sea turtles nesting on the Sandy Point National Wildlife Refuge, St. Croix, U.S. Virgin Islands (McDonald and Dutton, 1996). Leatherback sea turtles are believed to reach sexual maturity in six to ten years (Zug and Parham, 1996).

Kemp's Ridley Sea Turtle

Nesting occurs from April into July during which time the turtles appear off the Tamaulipas and Veracruz coasts of Mexico. Precipitated by strong winds, the females swarm to mass nesting emergences, known as *arribadas* or *arribazones*, to nest during daylight hours. Clutch size averages 100 eggs (U.S. Fish and Wildlife Service and National Marine Fisheries Service, 1992). Some females breed annually and nest an average of 1 to 4 times in a season at intervals of 10 to 28 days. Age at sexual maturity is believed to be between 7 to 15 years (Turtle Expert Working Group, 1998).

Population dynamics

Loggerhead Sea Turtle

Loggerhead sea turtles nest within the continental U.S. from Louisiana to Virginia. Major nesting concentrations in the U.S. are found on the Atlantic and Gulf coasts of Florida and on the coastal islands of North Carolina, South Carolina, and Georgia (Hopkins and Richardson, 1984). From a global perspective, the southeastern U.S. nesting aggregation is of primary importance to the survival of the species because it is second in size only to nesting on islands in the Arabian Sea off Oman (Ross, 1982; Ehrhart, 1989; NMFS and Service, 1991a). The status of the Oman colony has not been evaluated recently, but its location in a part of the world that is vulnerable to disruptive events (e.g., political upheavals, wars, catastrophic oil spills) causes considerable concern (Meylan *et al.*, 1995). The loggerhead nesting groups in Oman, the southeastern U.S., and Australia account for about 88 percent of nesting worldwide (NMFS and Service, 1991a). Total estimated nesting in the southeastern U.S. is approximately 68,000 to 90,000 nests per year (Florida FWC statewide nesting database 2002; Georgia DNR statewide nesting database 2002; SCDNR statewide nesting database 2002; NCWRC statewide nesting database 2002). About 80 percent of loggerhead nesting in the southeastern U.S. occurs in six Florida Atlantic coast

counties - Brevard, Indian River, St. Lucie, Martin, Palm Beach, and Broward counties (NMFS and Service, 1991a).

Adult loggerheads are known to migrate long distances between foraging areas and nesting beaches. During non-nesting years, adult females from U.S. beaches are distributed in waters off the eastern U.S. and throughout the Gulf of Mexico, Bahamas, Greater Antilles, and Yucatán.

Most loggerhead hatchlings originating from U.S. beaches are believed to spend their time in the open ocean of the North Atlantic gyre for an extended period of time, perhaps as long as 10 to 12 years, and are best known from the eastern Atlantic near the Azores and Madeira. Post-hatchlings have been found floating in association with *Sargassum* rafts. Once they become juveniles, they begin migrating to coastal areas in the western Atlantic where they become bottom feeders in lagoons, estuaries, bays, river mouths, and shallow coastal waters. These juveniles occupy coastal feeding grounds for a decade or more before maturing and making their first reproductive migration, the females returning to their birth beach to nest.

Green Sea Turtle

About 150 to 2,750 females are estimated to nest annually on beaches in the continental U.S. (Florida FWC, 2003) producing 500 to 9,000 nests. In the U.S. Pacific, over 90 percent of nesting throughout the Hawaiian archipelago occurs at the French Frigate Shoals, where about 200 to 700 females nest each year. Elsewhere in the U.S. Pacific, nesting takes place at scattered locations in the Commonwealth of the Northern Marianas, Guam, and American Samoa. In the western Pacific, the largest green turtle nesting group in the world occurs on Raine Island, Australia, where thousands of females nest nightly (Limpus et al., 1993). In the Indian Ocean, major nesting beaches occur in Oman where 30,000 females are reported to nest annually (Ross and Barwani, 1995).

Within the U.S., green turtles nest in small numbers in the U.S. Virgin Islands and Puerto Rico, and in larger numbers along the east coast of Florida, particularly in Brevard, Indian River, St. Lucie, Martin, Palm Beach, and Broward counties (NMFS and Service, 1991b). Nesting also has been documented along the Gulf coast of Florida from Escambia County through Franklin County and from Pinellas County through Collier County (Meylan *et al.*, 1995; Brost, 2003). The Florida green turtle nesting group is recognized as a regionally important colony. Green turtles have been known to nest in Georgia, but only on rare occasions (Winn, 1996). The green turtle also nests sporadically in North Carolina and South Carolina (Boettcher, 1998, 1996) and unconfirmed nests are reported in Alabama (Dailey, 1998).

Green turtles apparently have a strong nesting site fidelity and often make long distance migrations between feeding grounds and nesting beaches. Hatchlings have been observed to seek refuge and food in *Sargassum* rafts.

Leatherback Sea Turtle

Nesting grounds are distributed worldwide, with the Pacific coast of Mexico supporting the world's largest known concentration of nesting leatherback sea turtles. The largest nesting colony in the wider Caribbean region is found in French Guiana, but nesting occurs frequently, although in lesser numbers, from Costa Rica to Columbia and in Guyana, Surinam, and Trinidad (NMFS and Service, 1992; National Research Council, 1990a).

Recent annual estimates of global nesting populations indicate 26,000 to 43,000 nesting females (Spotila *et al.*, 1996). The current largest nesting populations occur in the western Atlantic in French Guiana (4,500 to 7,500 females nesting/year), Colombia (estimated several thousand nests annually), in the western Pacific in West Papua (formerly Irian Jaya), and Indonesia (about 600 to 650 females nesting/year).

In the U.S., small nesting populations occur on the Florida east coast (100 females/year) (Florida FWC, 2003), Sandy Point, U.S. Virgin Islands (50 to 190 females/year) (Alexander *et al.*, 2002), and Puerto Rico (30 to 90 females/year). Leatherback sea turtles have been known to nest in Georgia, South Carolina, and North Carolina, but only on rare occasions (Murphy, 1996; Winn, 1996; Boettcher, 1998). Leatherback sea turtle nesting also has been reported on the northwest coast of Florida (LeBuff, 1976; Longieliere *et al.*, 1997; Brost, 2003); a false crawl (non-nesting emergence) has been observed on Sanibel Island in southwest Florida (LeBuff, 1990).

Kemp's Ridley Sea Turtle

The 40,000 nesting females estimated from a single mass nesting emergence in 1947 reflected a much larger total number of nesting turtles in that year than exists today (Carr, 1963; Hildebrand, 1963). However, nesting in Mexico has been steadily increasing in recent years -- from 702 nests in 1985 to over 6,000 nests in 2000 (U.S. Fish and Wildlife Service, 2001). Despite protection for the nests, turtles have been and continue to be lost to incidental catch by shrimp trawls (U.S. Fish and Wildlife Service and National Marine Fisheries Service, 1992).

Status and distribution

Loggerhead Sea Turtle

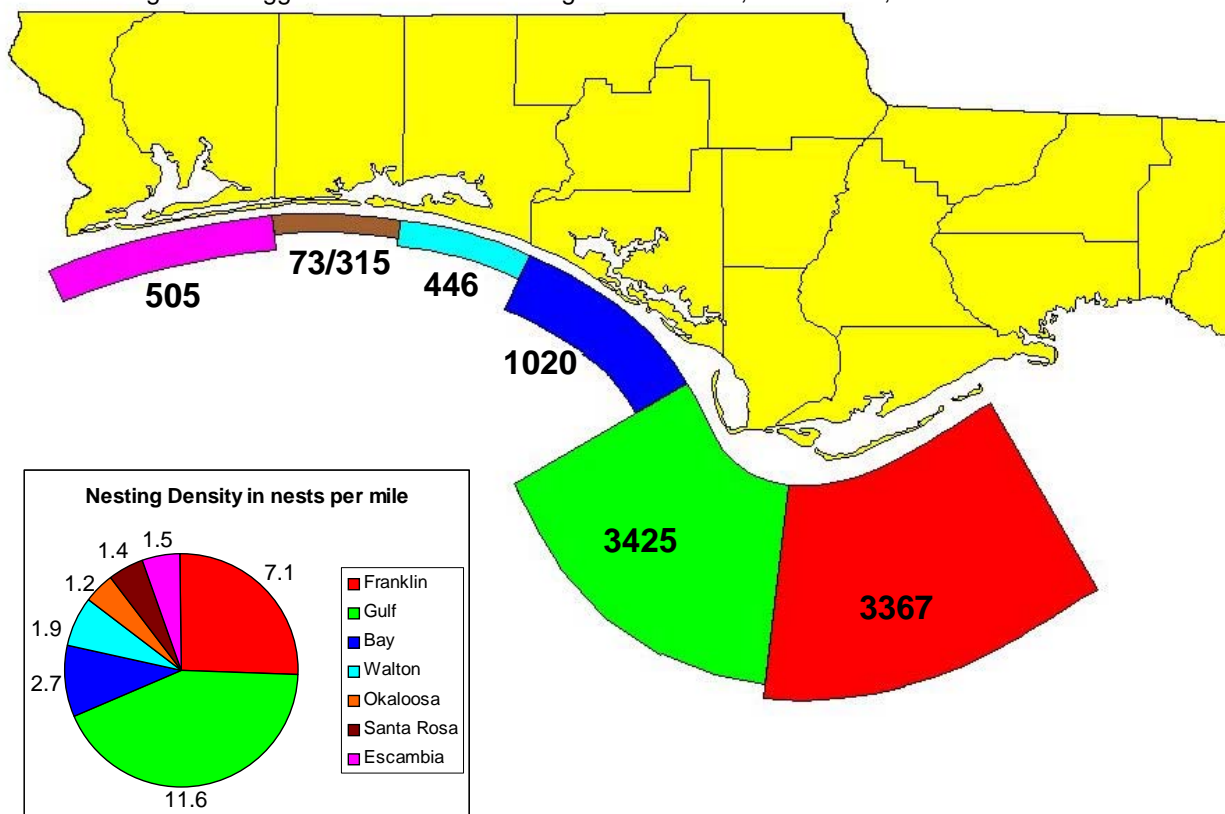
Genetic research (mtDNA) has identified five loggerhead nesting subpopulations in the western North Atlantic: (1) the Northern Subpopulation occurring from North Carolina south to around Cape Canaveral, Florida (about 29° N.); (2) South Florida Subpopulation occurring from about 29° N. on Florida's east coast to Sarasota on Florida's west coast; (3) Dry Tortugas, Florida, Subpopulation; (4) Northwest Florida Subpopulation occurring at Eglin Air Force Base and the beaches near Panama City; and (5) Yucatán Subpopulation occurring on the eastern Yucatán Peninsula, Mexico (Bowen *et al.*, 1993; Encalada *et al.*, 1998). These data indicate that gene flow between these four regions is very low. If nesting females are extirpated from one of these

regions, regional dispersal would not be sufficient to replenish the depleted nesting subpopulation.

The Northern Subpopulation has declined substantially since the early 1970's, but most of that decline occurred prior to 1979. No significant trend has been detected in recent years (Turtle Expert Working Group, 1998, 2000). Adult loggerheads of the South Florida Subpopulation have shown significant increases over the last 25 years, indicating that the population is recovering, although a trend could not be detected from the State of Florida's Index Nesting Beach Survey program from 1989 to 2002. Nesting surveys in the Northwest Florida and Yucatán Subpopulations have been too irregular to date to allow for a meaningful trend analysis (Turtle Expert Working Group, 1998, 2000).

Loggerheads are the most common nesting sea turtle and account for over 99 percent of the sea turtle nests in northwest Florida. The eastern portion of the region has the majority of loggerhead nesting (Figure 2). The loggerhead sea turtle nesting and hatching season for the region is generally considered to extend between May 1 and November 30. The earliest nest documented was on April 29 (St. Joseph Peninsula State Park) and the latest nest was on November 1 (Cape San Blas) (Brost, 2003). Nest incubation ranges from about 49 to 95 days.

Figure 2: Loggerhead sea turtle nesting in NW Florida, 1993–2002, Total nests 9151



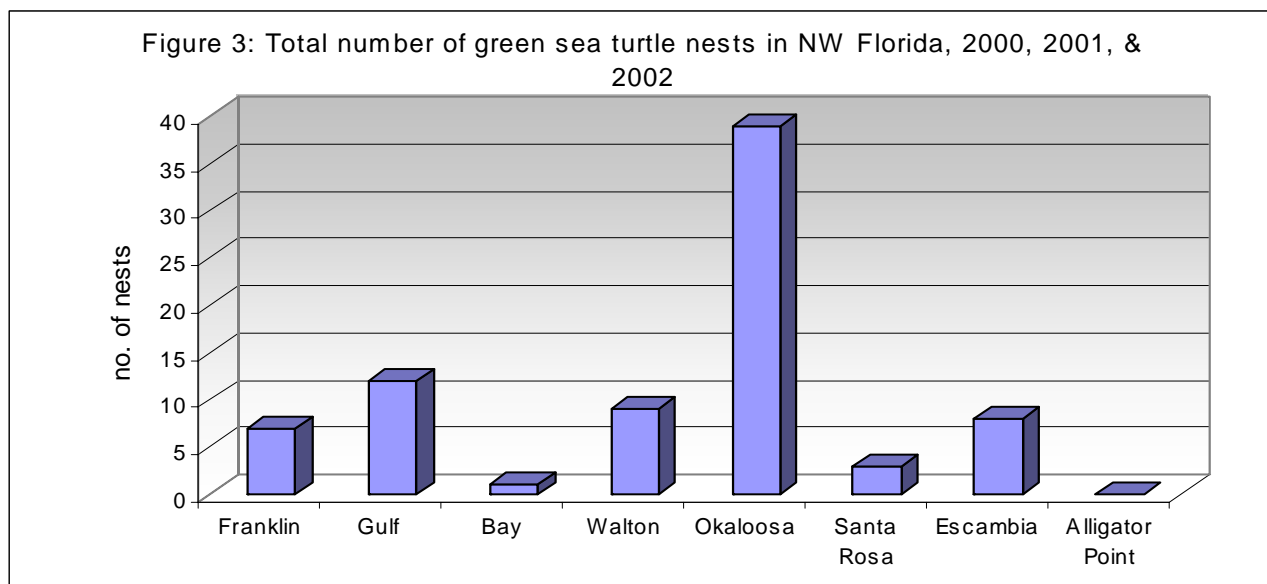
Threats to loggerhead sea turtles include incidental take from channel dredging and commercial trawling, longline, and gill net fisheries; loss or degradation of nesting habitat from coastal development and beach armoring; disorientation (attraction of hatchlings away from the water) by beachfront lighting; excessive nest predation by native and non-native predators; degradation of foraging habitat; marine pollution and debris; watercraft strikes; and disease. There is specific concern about the large amount of incidental take of juvenile loggerheads in the eastern Atlantic by longline fishing vessels from several countries.

In the southeastern U.S., major nest protection efforts and beach habitat protection are underway for most of the primary nesting areas, and progress has been made in reducing mortality from commercial fisheries in U.S. waters with the enforcement of turtle excluder device (TED) regulations. Many coastal counties and communities in Florida, Georgia, and South Carolina have developed beachfront lighting ordinances to reduce hatchling disorientations. Important U.S. nesting beaches have been and continue to be acquired for long-term protection. The migratory nature of loggerheads severely compromises these efforts once they move outside U.S. waters, however, because legal and illegal fisheries activities in some countries are causing high mortality on loggerhead sea turtle nesting populations of the western north Atlantic region. Due to the long range migratory movements of sea turtles between nesting beaches and foraging areas, long-term international cooperation is essential for recovery and stability of nesting populations.

Green Sea Turtle

Total population estimates for the green turtle are unavailable, and trends based on nesting data are difficult to assess because of large annual fluctuations in numbers of nesting females. For instance, in Florida, where the majority of green turtle nesting in the southeastern U.S. occurs, estimates range from 150 to 2,750 females nesting annually (Florida FWC, 2003). Populations in Surinam and Tortuguero, Costa Rica may be stable, but there is insufficient data for other areas to confirm a trend.

Green sea turtle nesting has been documented in all counties (but not on all beaches) in northwest Florida (Figure 3). The green sea turtle nesting and hatching season for this region extends from May 1 through October 31, the earliest nest was documented on May 20 (Santa Rosa Island) and the latest nest was documented on August 21 (Gulf Islands National Seashore). Nest incubation ranges from about 60 to 90 days. Nesting in northwest Florida has been consistently documented at least every other year since 1990 (Brost, 2003).



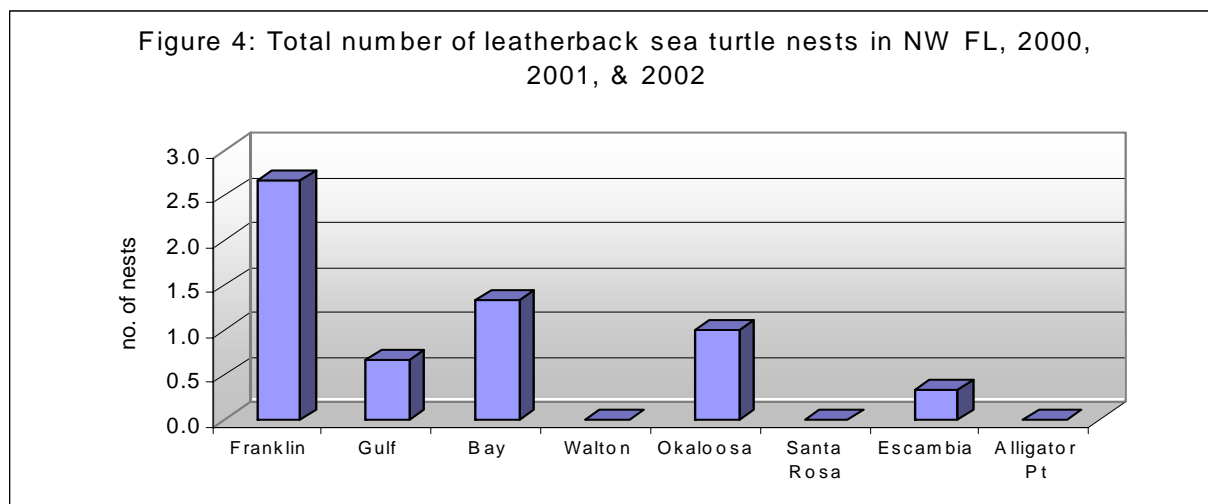
A major factor contributing to the green sea turtle's decline worldwide is commercial harvest for eggs and food. Fibropapillomatosis, a disease of sea turtles characterized by the development of multiple tumors on the skin and internal organs, is also a mortality factor and has seriously impacted green turtle populations in Florida, Hawaii, and other parts of the world. The tumors interfere with swimming, eating, breathing, vision, and reproduction. Turtles with heavy tumor burdens may die. Documented cases of fibropapillomatosis in northwest Florida are increasing (Redlow, 2003). Other threats include loss or degradation of nesting habitat from coastal development and beach armoring; disorientation of hatchlings by beachfront lighting; excessive nest predation by native and non-native predators; degradation of foraging habitat; marine pollution and debris; watercraft strikes; and incidental take from channel dredging and commercial fishing operations.

In the southeastern U.S., major nest protection efforts and beach habitat protection are underway at most of the larger nesting areas, and significant progress has been made in reducing mortality from commercial fisheries in U.S. waters with the enforcement of TED regulations. Many coastal counties and communities in Florida have developed beachfront lighting ordinances to reduce hatchling disorientations. Important U.S. nesting beaches have been and continue to be acquired for long-term protection. The Service and NOAA-Fisheries have been funding research on the fibropapilloma disease for several years to expand knowledge of the disease with the goal of developing an approach for remedying the problem. Due to the long range migratory movements of sea turtles between nesting beaches and foraging areas, long-term international cooperation is essential for recovery and stability of nesting populations.

Leatherback Sea Turtle

Declines in leatherback sea turtle nesting have occurred over the last two decades along the Pacific coasts of Mexico and Costa Rica. The Mexican leatherback sea turtle nesting population, once considered to be the world's largest leatherback sea turtle nesting population (65 percent of worldwide population), is now less than one percent of its estimated size in 1980. Spotila *et al.*, (1996) recently estimated the number of leatherback sea turtles nesting on 28 beaches throughout the world from the literature and from communications with investigators studying those beaches. The estimated worldwide population of leatherback sea turtles in 1995 was about 34,500 females on these beaches with a lower limit of about 26,200 and an upper limit of about 42,900. This is less than one third the 1980 estimate of 115,000. Leatherback sea turtles are rare in the Indian Ocean and in very low numbers in the western Pacific Ocean. The largest population is in the western Atlantic. Using an age-based demographic model, Spotila *et al.*, (1996) determined that leatherback sea turtle populations in the Indian Ocean and western Pacific Ocean cannot withstand even moderate levels of adult mortality and that even the Atlantic populations are being exploited at a rate that cannot be sustained. They concluded that leatherback sea turtles are on the road to extinction and further population declines can be expected unless action is taken to reduce adult mortality and increase survival of eggs and hatchlings.

Documented leatherback sea turtle nests are rare in northwest Florida. From 1993 to 2002, a total of 26 nests have been reported on northwest Florida beaches: fifteen in Franklin County, four in Bay County, three in Okaloosa County, three in Gulf County, and one in Escambia County (Brost, 2003) (Figure 4). The first recorded leatherback sea turtle nest in the region was in 1974, on St. Vincent Island, Franklin County. The majority of the nests have had low natural hatching success. The greatest number of successful nests in any one season occurred in 2000, when three leatherback sea turtle nests were documented to produce hatchlings that successfully emerged from the nest. One nest was on the Ft. Pickens Unit of Gulf Islands National Seashore, Escambia County and two of the nests were on Eglin Air Force Base, Santa Rosa Island, Okaloosa County. The leatherback sea turtle nesting and hatching season for this region extends from late April through October 31. For confirmed nesting, the earliest nest was documented on April 25 (St. George Island) and the latest nest documented on June 19 (Eglin). Documented nest incubation in northwest Florida ranges from about 63 to 84 days (Brost, 2003; Miller, 2001b; Nicholas, 2001).



The decline of the Pacific leatherback sea turtle population is believed primarily to be the result of exploitation by humans for the eggs and meat, as well as incidental take in numerous commercial fisheries of the Pacific. Other factors threatening leatherback sea turtles globally include loss or degradation of nesting habitat from coastal development; disorientation of hatchlings by beachfront lighting; excessive nest predation by native and non-native predators; degradation of foraging habitat; marine pollution and debris; and watercraft strikes.

It is crucial to maximize hatchling production for the remaining leatherback sea turtle nesting that occurs along the extensive Pacific coasts of Mexico, Costa Rica, and other Central American countries. Due to the long range migratory movements of sea turtles between nesting beaches and foraging areas, long-term international cooperation is essential for recovery and stability of nesting populations. From 1998 to 1999, the Service provided annual funding to assist recovery efforts for the leatherback sea turtles in Mexico and Costa Rica, including support for nesting surveys and nest protection. In the southeastern U.S. and U.S. Caribbean, major nest protection efforts and beach habitat protection are underway for most of the important nesting areas. In addition, research is underway to develop technologies to minimize leatherback sea turtle mortality associated with the longline fishery.

Many coastal counties and communities have developed beachfront lighting ordinances to reduce hatchling disorientations. Important U.S. nesting beaches have been and continue to be acquired for long-term protection.

Kemp's Ridley Sea Turtle

Eleven ridley nests have now been documented in Florida in Volusia, Lee, Sarasota, Pinellas, and Escambia counties (Brost, 2003; Nicholas, 2001). Hatchlings, after leaving the nesting

beach, are believed to become entrained in eddies within the Gulf of Mexico, where they are dispersed within the Gulf and Atlantic by oceanic surface currents until they reach about eight inches long, when they enter coastal shallow water habitats.

The decline of this species was primarily due to human activities, including the direct harvest of adults and eggs and incidental capture in commercial fishing operations. Today, under strict protection, the population appears to be in the early stages of recovery. The recent nesting increase can be attributed to full protection of nesting females and their nests in Mexico resulting from a bi-national effort between Mexico and the U.S. to prevent the extinction of the Kemp's ridley, and the requirement to use turtle excluder devices in shrimp trawls both in the United States and Mexico.

The Mexico government also prohibits harvesting and is working to increase the population through more intensive law enforcement, by fencing nest areas to diminish natural predation, and by relocating all nests into corrals to prevent poaching and predation. While relocation of nests into corrals is currently a necessary management measure, this relocation and concentration of eggs into a "safe" area is of concern since it makes the eggs more susceptible to reduced viability due to movement-induced mortality, disease vectors, catastrophic events like hurricanes, and marine predators once the predators learn where to concentrate their efforts.

Common threats to all sea turtles in Northwest Florida

Coastal development

Loss of nesting habitat related to development of the coastline has had the greatest impact on nesting sea turtles in northwest Florida. Beachfront development not only causes the loss of suitable nesting habitat but can result in the disruption of powerful coastal processes accelerating erosion and interrupting the natural shoreline migration (National Research Council, 1990b). This may in turn cause the need to protect upland structures and infrastructure by armoring, groin placement, beach berm construction, and beach nourishment which may cause changes to the remaining sea turtle habitat.

Hurricanes

A predominant threat to sea turtle nesting is tropical storms and hurricanes. In general, hurricanes result in severe erosion of the beach and dune systems. Overwash and blowouts are common on barrier islands. Hurricanes and other storms can result in the direct or indirect loss of sea turtle nests, either by erosion or washing away of the nests by wave action or inundation or "drowning" of the eggs or hatchlings developing within the nest or indirectly by loss of nesting habitat. Depending on their frequency, storms can affect sea turtles on either a short-term basis (nests lost for one season and/or temporary loss of nesting habitat) or long term, if

frequent (habitat unable to recover). How hurricanes affect sea turtle nesting also depends on its characteristics (winds, storm surge, rainfall), the time of year (within or outside of the nesting season), and where the northeast edge of the hurricane crosses land.

Because of the limited remaining nesting habitat, frequent or successive severe weather events could threaten the ability of certain sea turtle populations to survive and recover. Sea turtles evolved under natural coastal environmental events such as hurricanes. Hurricanes were probably responsible for maintaining coastal beach and dune nesting habitat through repeated cycles of destruction, alteration, and recovery. The extensive amount of pre-development coastal beach and dune habitat allowed sea turtles to survive even the most severe hurricane events. It is only within the last 20 to 30 years that the combination of habitat loss to beachfront development and destruction of remaining habitat by hurricanes has increased the threat to sea turtle survival and recovery. On developed beaches, typically little space remains for sandy beaches to become re-established after periodic storms. While the beach itself moves landward during such storms, reconstruction or persistence of structures at their pre-storm locations can result in a major loss of nesting habitat.

Beachfront Lighting

Beachfront lighting may cause disorientation (loss of bearings) and misorientation (incorrect orientation) of sea turtle hatchlings. Visual signs are the primary sea-finding mechanism for hatchlings (Mrosovsky and Carr, 1967; Mrosovsky and Shettleworth, 1968; Dickerson and Nelson, 1989; Witherington and Bjorndal, 1991). Artificial beachfront lighting is a documented cause of hatchling disorientation and misorientation on nesting beaches (Philbosian, 1976; Mann, 1977; Conti, 2003). The emergence from the nest and crawl to the sea is one of the most critical periods of a sea turtle's life. Hatchlings that do not make it to the sea quickly become food for ghost crabs, birds, and other predators or become dehydrated and may never reach the sea. Some types of beachfront lighting attract hatchlings away from the sea while some lights cause adult turtles to avoid stretches of brightly illuminated beach. Research has documented significant reduction in sea turtle nesting activity on beaches illuminated with artificial lights; relative to adjacent areas (Witherington, 1992). During the 2002 sea turtle nesting season in Florida, over 43,000 turtle hatchlings were disoriented. Lighting associated with condominiums had the greatest impact causing disorientation/misorientation of 35 percent. Other causes included street lights, parking lot lights, single family residences, and sky glow (Conti, 2003).

Predation

Depredation by a variety of predators can considerably decrease sea turtle nest hatching success. Depredation and harassment or both of nesting turtles, eggs, nests and hatchlings by native and non-native species, such as raccoon, coyote, fox, feral hog, cats, birds, and ghost crab, have been documented on the Atlantic and Gulf coasts of Florida (Daniel et al., 2002; Northwest Florida

Partnership, 2000; Leland, 1997; Maxwell, 2002; NMFS and Service, 1991a). As nesting habitat dwindles, it is essential that nest production be naturally maximized so the turtles may continue to exist in the wild.

Driving on the Beach

The operation of motor vehicles on the beach affects sea turtle nesting by interrupting a female turtle approaching the beach; headlights disorienting or misorienting emergent hatchlings; vehicles running over hatchlings attempting to reach the ocean; and vehicle tracks traversing the beach interfere with hatchlings reaching the ocean. Apparently, hatchlings become diverted not because they cannot physically climb out of the rut (Hughes and Caine, 1994), but because the sides of the track cast a shadow and the hatchlings lose their line of sight to the ocean horizon (Mann, 1977). The extended period of travel required to negotiate tire tracks and ruts may increase the susceptibility of hatchlings to dehydration and depredation during migration to the ocean (Hosier *et al.*, 1981). Driving directly above or over incubating egg clutches or on the beach can cause sand compaction which may result in adverse impacts on nest site selection, digging behavior, clutch viability, and emergence by hatchlings, decreasing nest success and directly killing pre-emergent hatchlings (Mann, 1977; Nelson and Dickerson, 1987; Nelson, 1988). Vehicle traffic on narrow beaches where driving is concentrated on the high beach and foredune may contribute to beach erosion.

Sea Turtle Nesting Surveys

The sea turtle survey in the Action Area is conducted by one entity. The Alligator Point Turtle Watch monitors nesting on Alligator Point peninsula except on Bald Point State Park lands (6.6 miles of 9.6 miles of beach). Alligator Point Turtle Watch program has been conducting the surveys since 2000. The monitoring is conducted under State of Florida permit no. 151. The Turtle Watch volunteers survey the beaches using an all terrain vehicle (ATV) (Barnett, 2004).

The Turtle Watch conducts the survey according to the State of Florida permit guidelines. Survey/monitoring are conducted seven days a week from May 1 to October 31. Surveys usually begin at sunrise but may begin one-half hour before sunrise. Turtle crawls are identified as a true nesting crawl or false crawl. Nests are marked with stakes and surrounded with surveyor flagging tape, and all nests are screened to prevent predation. The marked nests are monitored throughout the incubation period for storm damage, predation, hatching activity and hatch and emergence success. Nests are relocated within the first 12 hours of being deposited, or before 9 a.m. the morning following deposition, if threatened by erosion or inundation. Nests were either left in place (in situ) or relocated. Nests that were relocated were moved to higher beach elevations within the same vicinity of the original nest location.

Analysis of the species/critical habitat likely to be affected

The proposed action has the potential to adversely affect nesting females, nests, and hatchlings within the proposed project area. The effects of the proposed action on sea turtles will be considered further in the remaining sections of this biological opinion. Potential effects will vary depending on whether the work will be conducted within or outside of the sea turtle nesting season. Impacts that could occur include destruction of nests deposited within the boundaries of the proposed project, harassment in the form of disturbing or interfering with female turtles attempting to nest within the construction area or on adjacent beaches as a result of construction activities, disorientation of hatchling turtles on beaches adjacent to the construction area as they emerge from the nest and crawl to the water as a result of project lighting, behavior modification of nesting females due to escarpment formation within the project area during a nesting season resulting in false crawls or situations where they choose marginal or unsuitable nesting areas to deposit eggs. The quality of the placed sand could affect the ability of female turtles to nest, the suitability of the nest incubation environment, and the ability of hatchlings to emerge from the nest.

Critical habitat has not been designated in the continental United States; therefore, the proposed action would not result in an adverse modification.

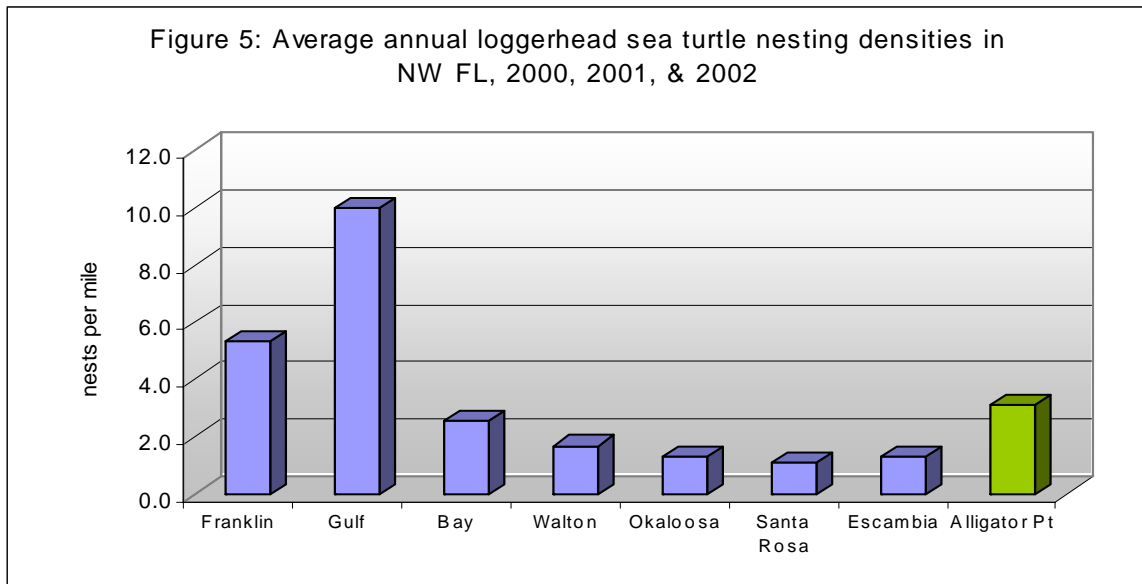
ENVIRONMENTAL BASELINE

Status of the species within the Action Area

Nesting

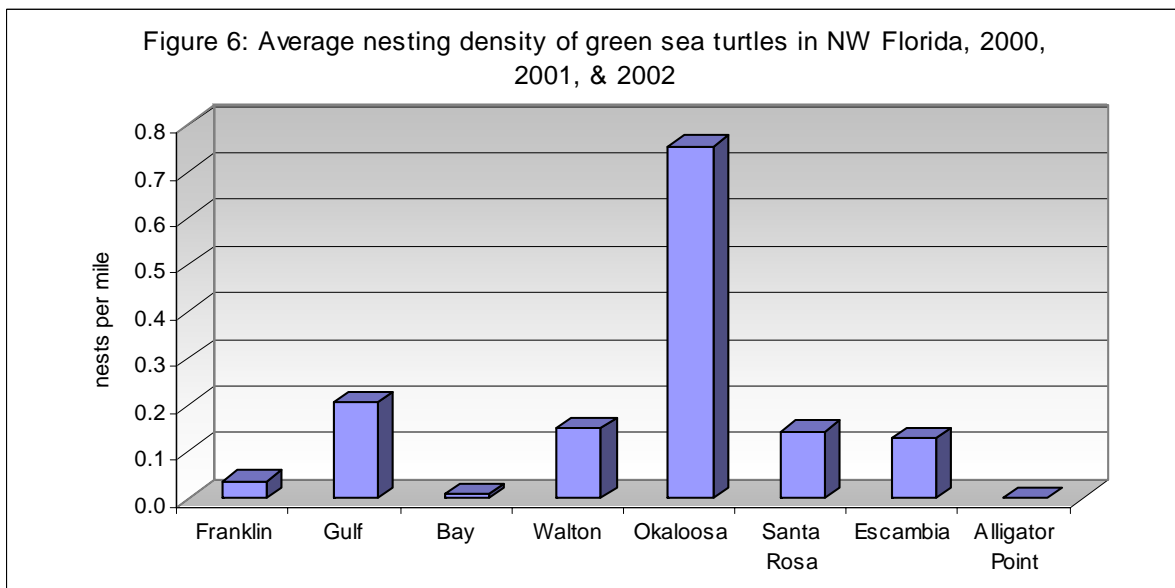
Loggerhead Sea Turtle

The loggerhead sea turtle nesting and hatching season for northern Gulf of Mexico beaches extends from May 1 through November 30. Incubation ranges from about 45 to 95 days in northwest Florida. Loggerhead nesting on the Alligator Point peninsula averaged about 3.1 nests per mile from 2000 to 2002 (Figure 5) (Brost, 2003; Barnett, 2004). During the sea turtle nesting seasons of 2000 to 2002, 44 loggerhead sea turtle nests were documented on Alligator Point peninsula (Brost, 2003). Loggerhead nests have been found in the Action Area in every year but 2001. Average annual nest incubation is 62 days for the years 2000 to 2002. Approximately 54 percent of all turtle crawls observed were false (non-nesting) crawls. The nests on Alligator Point peninsula have an emergence success rate (hatchlings that emerge from the nest) of 73 percent (Barnett, 2004).



Green Sea Turtle

The green sea turtle nesting and hatching season for the northern Florida Gulf of Mexico extends from May 15 through October 31 (Figure 6). Incubation ranges from about 45 to 75 days. One green sea turtle nest was documented within the Action Area in 2003 (Barnett, 2004).



Leatherback Sea Turtle

The leatherback sea turtle nesting and hatching season for northern Gulf of Mexico beaches extends from June 1 through September 30. Incubation ranges from about 55 to 75 days. Leatherback sea turtle nests have been documented on St. George Island and Dog Island in Franklin County. However, no leatherback sea turtle nests have been documented on Alligator Point peninsula beaches (Brost, 2003; Barnett, 2004).

Kemp's Ridley Sea Turtle

No Kemp's ridley sea turtle nests have been documented within the Action Area (Barnett, 2004; Brost, 2002). Only one Ridley sea turtle has been documented in northwest Florida on Gulf Islands National Seashore, Perdido Key Unit, Escambia County in 1998 (Nicholas, 2000b).

Factors affecting the species environment within the action area

Erosion

Two areas on the Alligator Point peninsula have been designated as critically eroding by the State of Florida (FDEP, Office of Beaches and Coastal Systems, 2003). Critical erosion is defined by State of Florida as "a segment of the shoreline where natural processes or human activity have caused or contributed to erosion and recession of the beach or dune system to such a degree that upland development, recreational interests, wildlife habitat, or important cultural resources are threatened or lost. Critical erosion areas may also include peripheral segments or gaps between identified critical erosion areas which, although they may be stable or slightly erosional now, their inclusion is necessary for continuity of management of the coastal system or for the design integrity of adjacent beach management projects" FDEP, Office of Beaches and Coastal Systems, 1999). A portion of the Action Area is within one of the designated critically eroding areas. Reference monuments R-210 thru R-216 have been designated; of which R-212 and R-213 are within the Action Area (FDEP, Office of Beaches and Coastal Systems, 2003).

Alligator Point is a narrow peninsula along the eastern shoreline of Franklin County. Historically, the peninsula is characterized by high rates of shoreline erosion (1.8 feet per year)(Coastal Tech and Preble-Rish, 2001). As a result since the 1970s, County Road 370 has been vulnerable to increased erosion especially during storms. Numerous projects have been implemented to protect the road. None have been successful and all have ultimately failed. Following Hurricane Alberto in 1994, a cement-capped rock revetment was constructed. At that time 100 feet of beach remained seaward of the revetment. Today, no beach remains in the Action Area.

Beachfront Lighting

Impacts to nesting turtles and their hatchlings from beachfront artificial lighting continue to be a concern on Alligator Point, although Franklin county adopted a beachfront lighting ordinance in 1998. The negative effects of beachfront lighting may increase with the beach restoration project because the beach is elevated with the addition of sand. Dunes can help shield some of the light from beachfront development. However, the dunes that will be constructed as part of the proposed project will not be high enough to substantially reduce lighting disorientation from either beachfront development, roadway lighting, or the ambient glow of more landward development.

EFFECTS OF THE ACTION

Factors to be Considered

The proposed project is considered to be a one-time beach restoration event with the possibility of annual sand replenishment. The work will occur within habitat that is used by sea turtles for nesting. Although the work is proposed to be conducted outside the sea turtle nesting season it could occur during the season depending on the material availability and the level of water on the Apalachicola River. Even when conducted outside the nesting season short or long-term and temporary or permanent impacts from the proposed action could result in changes in the nest incubation environment and the physical characteristics of the beach from the material placed on the beach. When the work is conducted within the nesting season additional direct impacts may occur to nesting female turtles, their nests, and hatchling turtles as they emerged from the nest. Thus, the analysis will evaluate the project as being conducted during the sea turtle nesting season between May 1 and October 31.

The proposed project will occur within habitat that is used by sea turtles for nesting and may be constructed during a portion of the sea turtle nesting season. Long-term and permanent impacts from the dredging could include a change in the nest incubation environment from the nourishment material. Short-term and temporary impacts to sea turtle nesting activities could result from project work occurring on the nesting beach during the active nesting or hatching period, changes in the physical characteristics of the beach from the placement of the beach nourishment material and change in the nest incubation environment from the nourishment material.

Proximity of Action: The beach restoration activities would occur directly in and adjacent to nesting habitat for sea turtles and dune habitats that ensure the stability and integrity of the peninsula. Specifically, the project would potentially impact nesting and hatchling loggerhead, green, leatherback, and Kemp's ridley sea turtles.

Distribution: The beach restoration activities that may impact nesting and hatchling sea turtles would occur along the 2,500-feet of beachfront. Specifically, the project activities will cover the Gulf of Mexico beachfront near FDEP reference monument R-212 on Alligator Point peninsula in Franklin County.

Timing: The sea turtle nesting season for northwest Florida is considered to extend between May 1 and November 30. The timing of the beach restoration activities could directly and indirectly impact nesting and hatchling sea turtles when conducted at night between these times. However, based on 5 years of data, sea turtle nesting and hatching season on the beaches of Alligator Point peninsula occurs between mid-May and late October. However, monitoring begins on May 1 each year.

Nature of the Effect: The effects of the beach restoration activities may change the nesting behavior of adult female sea turtles or diminish the nesting success, change the behavior of hatchling sea turtles, and result in nests or hatching events to be missed during the daily survey of the subject sea turtle species. Any decrease in productivity, emergence, and/or survival rates would contribute to a vulnerability and endangerment of loggerhead, green, leatherback sea turtles, and Kemp's ridley sea turtles.

Duration: The beach restoration is considered a one-time activity that will take between 2 and 3 weeks to complete. Annual re-nourishment events are anticipated to take a similar amount of time. Thus, the direct effects should be short-term in duration. Indirect effects from the activity may continue to impact nesting and hatchling sea turtles in subsequent nesting seasons.

Disturbance frequency: The northwest Florida sub-populations of the various sea turtle species could experience decreased nesting success, hatching success and hatchling emergence with repeated monthly disturbance, resulting from the beach restoration activities being conducted at night during one nesting season. Subsequent annual replenishment of sand is planned on an annual basis outside of the sea turtle nesting season.

Disturbance intensity and severity: Depending on the timing of the beach restoration activities during sea turtle nesting season, effects to the loggerhead sea turtle population of northwest Florida, and potentially the U.S., populations could be important. For loggerhead sea turtles, especially, extirpation of the northwest Florida sub-population would probably not be replenished by regional dispersal from other nesting sub-populations.

Beneficial effects

The placement of sand on a beach with reduced dry fore-dune habitat may increase sea turtle nesting habitat if the placed sand is highly compatible (i.e., grain size, shape, color, etc.) with naturally occurring beach sediments in the area, and compaction and escarpment remediation measures are incorporated into the project. In addition, a nourished beach that is designed and

constructed to mimic a natural beach system may be more stable than the eroding one it replaces, thereby benefitting sea turtles.

Direct effects

Placement of sand on an eroded section of beach or an existing beach may not provide suitable nesting habitat for sea turtles. Although beach restoration may increase the potential nesting area, significant negative impacts to sea turtles may result if protective measures are not incorporated during construction. Restoration during the nesting season, particularly on or near high density nesting beaches, can cause increased loss of offspring from human-caused mortality and, along with other mortality sources, may significantly impact the long-term survival of the species. For instance, projects conducted during the nesting and hatching season could result in the loss of sea turtles through disruption of adult nesting activity and by burial or crushing of nests or hatchlings. While a nest monitoring and egg relocation program would reduce these impacts, nests may be inadvertently missed or misidentified as false crawls during daily patrols. In addition, nests may be destroyed by operations at night prior to beach patrols being performed.

1. *Nest relocation*

Besides the potential for missing nests during a nest relocation program, there is a potential for eggs to be damaged by their movement, particularly if eggs are not relocated within 12 hours of deposition (Limpus *et al.*, 1979). Nest relocation can have adverse impacts on incubation temperature (and hence sex ratios), gas exchange parameters, hydric environment of nests, hatching success, and hatchling emergence (Limpus *et al.*, 1979; Ackerman 1980; Parmenter 1980; Spotila *et al.*, 1983; McGehee, 1990). Relocating nests into sands deficient in oxygen or moisture can result in mortality, morbidity, and reduced behavioral competence of hatchlings. Water availability is known to influence the incubation environment of the embryos and hatchlings of turtles with flexible-shelled eggs, which has been shown to affect nitrogen excretion (Packard *et al.*, 1984), mobilization of calcium (Packard and Packard, 1986), mobilization of yolk nutrients (Packard *et al.*, 1985), hatchling size (Packard *et al.*, 1981; McGehee, 1990), energy reserves in the yolk at hatching (Packard *et al.*, 1988), and locomotory ability of hatchlings (Miller *et al.*, 1987).

In a 1994 Florida study comparing loggerhead hatching and emergence success of relocated nests with *in situ* nests, Moody (1998) found that hatching success was lower in relocated nests at 9 of 12 beaches evaluated and emergence success was lower in relocated nests at 10 of 12 beaches surveyed in 1993 and 1994.

2. Equipment

The placement of pipelines and the use of heavy machinery on the beach during a construction project may also have adverse effects on sea turtles. They can create barriers to nesting females emerging from the surf and crawling up the beach, causing a higher incidence of false crawls and unnecessary energy expenditure.

3. Artificial lighting

Visual cues are the primary sea-finding mechanism for hatchling sea turtles (Mrosovsky and Carr, 1967; Mrosovsky and Shettleworth, 1968; Dickerson and Nelson, 1989; Witherington and Bjorndal, 1991). When artificial lighting is present on or near the beach, it can misdirect hatchlings once they emerge from their nests and prevent them from reaching the ocean (Philibosian, 1976; Mann 1977; Florida Fish and Wildlife Conservation Commission sea turtle disorientation database). In addition, a significant reduction in sea turtle nesting activity has been documented on beaches illuminated with artificial lights (Witherington, 1992). Therefore, construction lights along a project beach and on the dredging vessel may deter females from coming ashore to nest, misdirect females trying to return to the surf after a nesting event, and misdirect emergent hatchlings from adjacent non-project beaches. Any source of bright lighting can profoundly affect the orientation of hatchlings, both during the crawl from the beach to the ocean and once they begin swimming offshore. Hatchlings attracted to light sources on dredging barges may not only suffer from interference in migration, but may also experience higher probabilities of predation to predatory fishes that are also attracted to the barge lights. This impact could be reduced by using the minimum amount of light necessary (may require shielding) or low pressure sodium lighting during project construction.

Indirect effects

Indirect effects are those effects that are caused by or result from the proposed action, are later in time, and are reasonably certain to occur. Effects from the proposed project may continue to affect sea turtle nesting on the project beach and adjacent beaches in future years. These effects consist of the following.

Many of the direct effects of beach restoration may persist over time and become indirect impacts. These indirect effects include increased susceptibility of relocated nests to catastrophic events, the consequences of potential increased beachfront development, changes in the physical characteristics of the beach, the formation of escarpments, and future sand migration.

1. *Increased susceptibility to catastrophic events*

Nest relocation may concentrate eggs in an area making them more susceptible to catastrophic events. Hatchlings released from concentrated areas also may be subject to greater predation rates from both land and marine predators, because the predators learn where to concentrate their efforts (Glenn, 1998; Wyneken *et al.*, 1998).

2. *Increased beachfront development*

Pilkey and Dixon (1996) state that beach replenishment frequently leads to more development in greater density within shorefront communities that are then left with a future of further replenishment or more drastic stabilization measures. Dean (1999) also notes that the very existence of a beach restoration project can encourage more development in coastal areas. Following completion of a beach restoration project in Miami during 1982, investment in new and updated facilities substantially increased tourism there (National Research Council, 1995). Increased building density immediately adjacent to the beach often resulted as older buildings were replaced by much larger ones that accommodated more beach users. Overall, shoreline management creates an upward spiral of initial protective measures resulting in more expensive development which leads to the need for more and larger protective measures. Increased shoreline development may adversely affect sea turtle nesting success. Greater development may support larger populations of mammalian predators, such as foxes and raccoons, than undeveloped areas (National Research Council, 1990a), and can also result in greater adverse effects due to artificial lighting, as discussed above.

3. *Changes in the physical environment*

Beach restoration may result in changes in sand density (compaction), beach shear resistance (hardness), beach moisture content, beach slope, sand color, sand grain size, sand grain shape, and sand grain mineral content if the placed sand is dissimilar from the original beach sand (Nelson and Dickerson, 1988a). These changes could result in adverse impacts on nest site selection, digging behavior, clutch viability, and emergence by hatchlings (Nelson and Dickerson, 1987; Nelson, 1988).

Beach compaction and unnatural beach profiles that may result from beach restoration activities could negatively impact sea turtles regardless of the timing of projects. Very fine sand and/or the use of heavy machinery can cause sand compaction on nourished beaches (Nelson *et al.*, 1987; Nelson and Dickerson, 1988a). Significant reductions in nesting success (i.e., false crawls occurred more frequently) have been documented on severely compacted nourished beaches (Fletemeyer, 1980; Raymond, 1984; Nelson and Dickerson, 1987; Nelson *et al.*, 1987), and increased false crawls may result in increased physiological stress to nesting females. Sand compaction may increase the length of time required for female sea turtles to excavate nests and also cause increased physiological stress to the animals (Nelson and Dickerson, 1988c). Nelson

and Dickerson (1988b) concluded that, in general, beaches nourished from offshore borrow sites are harder than natural beaches, and while some may soften over time through erosion and accretion of sand, others may remain hard for 10 years or more.

These impacts can be minimized by using suitable sand and by tilling compacted sand after project completion. The level of compaction of a beach can be assessed by measuring sand compaction using a cone penetrometer (Nelson, 1987). Tilling of a nourished beach with a root rake may reduce the sand compaction to levels comparable to unnourished beaches. However, a pilot study by Nelson and Dickerson (1988c) showed that a tilled nourished beach will remain uncompacted for up to 1 year. Therefore, the Service requires multi-year beach compaction monitoring and, if necessary, tilling to ensure that project impacts on sea turtles are minimized.

A change in sediment color on a beach could change the natural incubation temperatures of nests in an area, which, in turn, could alter natural sex ratios. To provide the most suitable sediment for nesting sea turtles, the color of the nourished sediments must resemble the natural beach sand in the area. Natural reworking of sediments and bleaching from exposure to the sun would help to lighten dark restoration sediments; however, the timeframe for sediment mixing and bleaching to occur could be critical to a successful sea turtle nesting season.

The Corps conducted an evaluation of the potential uses of the dredged material from the Apalachicola River (PBS&J, 2001). The study found that the sand was coarser in grain size than most of northwest Florida's existing beaches and darker in color. However, the eastern panhandle exhibits coarser grains than the western beaches. Sand color is also darker. Our participation in the study and subsequent review indicates that the restoration material is suitable for use on the Action Area. Thus, we would anticipate that impacts to sea turtles, nests, eggs, and hatchlings should be minimal.

4. Escarpment formation

On nourished beaches, steep escarpments may develop along their water line interface as they adjust from an unnatural construction profile to a more natural beach profile (Coastal Engineering Research Center 1984; Nelson *et al.*, 1987). These escarpments can hamper or prevent access to nesting sites (Nelson and Blihovde, 1998). Researchers have shown that female turtles coming ashore to nest can be discouraged by the formation of an escarpment, leading to situations where they choose marginal or unsuitable nesting areas to deposit eggs (e.g., in front of the escarpments, which often results in failure of nests due to prolonged tidal inundation). This impact can be minimized by leveling any escarpments prior to the nesting season.

Species response to the proposed action

Ernest and Martin (1999) conducted a comprehensive study to assess the effects of beach restoration on loggerhead sea turtle nesting and reproductive success. The following findings

illustrate sea turtle responses to and recovery from a restoration project. A significantly larger proportion of turtles emerging on nourished beaches abandoned their nesting attempts compared to turtles emerging on Control or pre-nourished beaches. This reduction in nesting success was most pronounced during the first year following project construction and is most likely the result of changes in physical beach characteristics associated with the restoration project (e.g., beach profile, sediment grain size, beach compaction, frequency and extent of escarpments). During the first post-construction year, the time required for turtles to excavate an egg chamber on the untilled, hard-packed sands of one treatment area increased significantly relative to Control and background conditions. However, in another treatment area, tilling was effective in reducing sediment compaction to levels that did not significantly prolong digging times. As natural processes reduced compaction levels on nourished beaches during the second post-construction year, digging times returned to background levels.

During the first post-construction year, nests on the nourished beaches were deposited significantly farther from both the toe of the dune and the tide line than were nests on control beaches. Furthermore, nests were distributed throughout all available habitat and were not clustered near the dune as they were in the Control. As the width of nourished beaches decreased during the second year, among-treatment differences in nest placement diminished. More nests were washed out on the wide, flat beaches of the nourished treatments than on the narrower steeply sloped beaches of the Control. This phenomenon persisted through the second post-construction year monitoring and resulted from the placement of nests near the seaward edge of the beach berm where dramatic profile changes, caused by erosion and scarping, occurred as the beach equilibrated to a more natural contour.

As with other beach restoration projects, Ernest and Martin (1999) found that the principal effect of restoration on sea turtle reproduction was a reduction in nesting success during the first year following project construction. Although most studies have attributed this phenomenon to an increase in beach compaction and escarpment formation, Ernest and Martin indicate that changes in beach profile may be more important. Regardless, as a nourished beach is reworked by natural processes in subsequent years and adjusts from an unnatural construction profile to a more natural beach profile, beach compaction and the frequency of escarpment formation decline, and nesting and nesting success return to levels found on natural beaches.

This biological opinion is based on effects that are anticipated to loggerhead, green, leatherback, or Kemp's ridley sea turtles (nesting females, eggs, or hatchlings) because: 1) the project may be conducted during the sea turtle nesting season, and 2) the restored beach may cause a change in the behavior of nesting female turtles or a change in the nest incubation environment for an unknown period of time. In the context of sea turtle nests within the 2,500-foot Action Area, an average of two loggerhead sea turtle nests could be deposited during any one nesting season including the year the project is constructed, one green sea turtle nest could be deposited every other year during the life of the project or during the year the project is constructed, one

leatherback sea turtle nest could be deposited every year during the life of the project during the life of the project. Any of these nests could be impacted by the proposed project. No Kemp's ridley sea turtle nests are expected to be deposited on the project beaches.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, local, or private actions that are reasonably certain to occur in the proposed Action Area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. The beaches within the Action Area were privately owned; however, Franklin County condemned the property within the Action Area because homes were falling in the water from erosion.

CONCLUSION

After reviewing the current status of the loggerhead, green, leatherback, and Kemp's ridley sea turtles, the environmental baseline for the Action Area, the effects of the proposed dredging and beach restoration, and the cumulative effects, it is the Service's biological opinion that the project, as proposed, is not likely to jeopardize the continued existence of the loggerhead, green, leatherback, or Kemp's ridley sea turtles. No critical habitat has been designated for any of the sea turtle species in the continental United States; therefore, none will be affected.

Despite the Conservation Measures proposed as part of the action, the proposed project will adversely affect approximately 15 acres of sea turtle nesting habitat along approximately 2,500 feet of Gulf of Mexico beachfront. The Action Area beach supports an average of two loggerhead sea turtle nests annually, one green sea turtle nest bi-annually, one leatherback sea turtle nest annually, and no Kemp's ridley sea turtle nests. Research has shown that the principal effect of beach restoration on sea turtle reproduction is a reduction in nesting success, and this reduction is most often limited to the first year following project construction. Research has also shown that the impacts of a restoration project on sea turtle nesting habitat are typically short-term because a restored beach will be reworked by natural processes in subsequent years, and beach compaction and the frequency of escarpment formation will decline. Although a variety of factors, including some that cannot be controlled, can influence how a restoration project will perform from an engineering perspective, measures can be implemented to minimize impacts to sea turtles.

INCIDENTAL TAKE STATEMENT

Section 9 of the Endangered Species Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered or threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed

species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, carrying out an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited under the Act provided that such taking is in compliance with the terms and conditions of this incidental take statement.

The measures described below are non-discretionary, and must be included in the Corps project plans for the exemption in section 7(o)(2) to apply. The Corps has a continuing duty to implement the activity covered by this incidental take statement. If the Corps (1) fails to assume and implement the terms and conditions or (2) fails to adhere to the terms and conditions of the incidental take statement, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the Corps must report the progress of the project and its impacts on the species to the Service as specified in the incidental take statement [50 CFR §402.14(I)(3)].

AMOUNT OR EXTENT OF TAKE

The Service has reviewed the biological information and other information relevant to this action. The Service anticipates 2,500 feet of nesting beach habitat could be taken as a result of this proposed action. The take is expected to be in the form of: (1) destruction of all nests that may be constructed and eggs that may be deposited and missed by a nest survey and egg relocation program within the boundaries of the proposed project; (2) destruction of all nests deposited during the period when a nest survey and egg relocation program is not required to be in place within the boundaries of the proposed project; (3) reduced hatching success due to egg mortality during relocation and adverse conditions at the relocation site; (4) harassment in the form of disturbing or interfering with female turtles attempting to nest within the construction area or on adjacent beaches as a result of construction activities; (5) misdirection of hatchling turtles on beaches adjacent to the construction area as they emerge from the nest and crawl to the water as a result of project lighting; (6) behavior modification of nesting females due to escarpment formation within the project area during a nesting season, resulting in false crawls or situations where they choose marginal or unsuitable nesting areas to deposit eggs; and (7) destruction of nests from escarpment leveling within a nesting season when such leveling has been approved by the Fish and Wildlife Service.

Incidental take is anticipated for only the 2,500 feet of beach that have been identified for sand placement. The Service anticipates incidental take of sea turtles will be difficult to detect for the following reasons: (1) the turtles nest primarily at night and all nests are not found because [a] natural factors, such as rainfall, wind, and tides may obscure crawls and [b] human-caused factors, such as pedestrian and vehicular traffic, may obscure crawls, and result in nests being

destroyed because they were missed during a nesting survey and egg relocation program; (2) the total number of hatchlings per undiscovered nest is unknown; (3) the reduction in percent hatching and emerging success per relocated nest over the natural nest site is unknown; (4) an unknown number of females may avoid the project beach and be forced to nest in a less than optimal area; (5) lights may disorient an unknown number of hatchlings and cause death; and (6) escarpments may form and cause an unknown number of females from accessing a suitable nesting site.

Take of these species can be anticipated by the disturbance and restoration of suitable turtle nesting beach habitat because: (1) turtles nest within the project site; (2) beach restoration will likely occur during a portion of the nesting season; (3) the restoration project will modify the incubation substrate, beach slope, and sand compaction; and (4) artificial lighting will disorient nesting females and hatchlings. We anticipate, on an annual basis, take to include two loggerhead sea turtle nests, one green sea turtle nest every other year, one leatherback sea turtle nest, and no Kemp's ridley sea turtle nests.

EFFECT OF THE TAKE

In the accompanying biological opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to loggerhead, green, leatherback, or Kemp's ridley sea turtles. Critical habitat has not been designated in the Action Area; therefore, the project will not result in destruction or adverse modification of critical habitat for loggerhead, green, leatherback, or Kemp's ridley sea turtles.

Incidental take of nesting and hatchling sea turtles is anticipated to occur during the project construction and during the life of the project. The take will occur on nesting habitat consisting of the length of the beach where the restoration material will be placed.

REASONABLE AND PRUDENT MEASURES

The following reasonable and prudent measures are necessary and appropriate to minimize take of sea turtles in the proposed beach restoration Action Area. The Alligator Point Beach Restoration Project may be conducted during the sea turtle nesting season (May 1 through October 31), provided the following reasonable and prudent measures are incorporated into the project plans.

1. Beach quality sand suitable for sea turtle nesting, successful incubation, and hatchling emergence shall be used for the beach restoration project.
2. If the beach restoration project will be conducted during the sea turtle nesting season, surveys for nesting sea turtles shall be conducted. If nests are constructed in the area of beach restoration, the eggs shall be relocated.

3. Sea turtle nesting surveys shall be conducted for three years following the project implementation. If the project is completed on an annual basis, surveys shall continue for the length of the project plus an additional three nesting seasons.
4. Immediately after completion of the beach restoration project and prior to the next three nesting seasons, beach compaction shall be monitored and tilling shall be conducted as required to reduce the likelihood of impacting sea turtle nesting and hatching activities.
5. Immediately after completion of the beach restoration project and prior to the next three nesting seasons, monitoring shall be conducted to determine if escarpments are present, and if present, shall be leveled as required to reduce the likelihood of impacting sea turtle nesting activities.
6. The Corps shall ensure that contractors doing the beach restoration work fully understand the sea turtle protection measures detailed in this incidental take statement.
7. During the sea turtle nesting season, construction equipment and materials shall be stored in a manner that will minimize impacts to sea turtles to the maximum extent practicable.
8. During the sea turtle nesting season, lighting associated with the project shall be minimized to reduce the possibility of disrupting and disorienting nesting and/or hatchling sea turtles.
9. All dune restoration and planting shall be designed and conducted to minimize impacts to sea turtles.

TERMS AND CONDITIONS

In order to be exempt from the prohibitions of section 9 of the Endangered Species Act, the Corps must assure that they or their contractors comply with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are non-discretionary.

Proposed Work

All fill material placed shall be sand that is similar to a native beach in the vicinity of the site that has not been affected by prior restoration or restoration activities. The fill material shall be similar in grain size distribution to the native beach. All such fill material shall be free of

construction debris, rocks, or other foreign matter and shall not contain, on average, greater than 10 percent fines (i.e., silt and clay) (passing the #200 sieve) and shall not contain, on average, greater than 5 percent coarse gravel or cobbles, exclusive of shell material (retained by the #4 sieve).

Protection of Sea Turtles

1. Daily early morning surveys will be required if any portion of the beach restoration project occurs during the period from May 1 through October 31. Nesting surveys will be initiated 70 days prior to restoration activities or by May 1, whichever is later. Nesting surveys shall continue through the end of the project or through September 1, whichever is earlier. Hatching and emerging success monitoring will involve checking nests beyond the completion date of the daily early morning nesting surveys. If nests are laid in areas where they may be affected by restoration activities, eggs shall be relocated per the following requirements.
 - 1a. Nesting surveys and egg relocations will only be conducted by personnel with prior experience and training in nest survey and egg relocation procedures. Surveyors shall have a valid Florida Fish and Wildlife Conservation Commission permit. Nest surveys shall be conducted daily between sunrise and 9 a.m. Surveys shall be performed in such a manner so as to ensure that construction activity does not occur in any location prior to completion of the necessary sea turtle protection measures.
 - 1b. Only those nests that may be affected by construction activities will be relocated. Nests requiring relocation shall be moved no later than 9 a.m. the morning following deposition to a nearby self-release beach site in a secure setting where artificial lighting will not interfere with hatchling orientation. The relocation sites shall be approved by the Fish and Wildlife Service prior to usage. Nest relocations in association with construction activities shall cease when construction activities no longer threaten nests. Any nests left in the active construction zone shall be clearly marked, and all mechanical equipment shall avoid nests by at least 10 feet.
 - 1c. Nests deposited within areas where restoration activities have ceased or will not occur for 70 days shall be marked and left *in situ* unless other factors threaten the success of the nest. The turtle permit holder shall install an on-beach marker at the nest site and a secondary marker at a point landward as possible to assure that future location of the nest will be possible should the on-beach marker be lost. A series of stakes and highly visible survey ribbon or string shall be installed to establish an area of 10 feet radius surrounding the nest. No activity will occur

within this area nor will any activity occur which could result in impacts to the nest. Nest sites shall be inspected daily to assure nest markers remain in place and the nest has not been disturbed by the restoration activity.

2. Sea turtle nesting surveys shall be conducted for three years following the project implementation. If the project is completed on an annual basis, surveys shall continue for the length of the project plus an additional three nesting seasons. Surveys shall be conducted per 1a, 1b, and 1c above.
3. Immediately after completion of the beach restoration project and prior to May 1, for three subsequent years, sand compaction shall be monitored in the area of beach restoration in accordance with a protocol agreed to by the Fish and Wildlife Service, the Florida Fish and Wildlife Conservation Commission, and the applicant. At a minimum, the protocol provided under 3a. and 3b. below shall be followed. If required, the area shall be tilled to a depth of 36 inches. All tilling activity shall be completed prior to May 1. If the project is completed during the nesting season, tilling will not be performed in areas where nests have been left in place or relocated. A report on the results of compaction monitoring shall be submitted to the Fish and Wildlife Service prior to any tilling actions being taken. An annual summary of compaction surveys and the actions taken shall be submitted to the Fish and Wildlife Service. (NOTE: If the restoration is completed within 30 days of May 1, the compaction monitoring/tiling accomplished will be considered as one of the three years. The requirement for compaction monitoring can be eliminated if the decision is made to till regardless of post-construction compaction levels. Also, out-year compaction monitoring and remediation are not required if placed material no longer remains on the dry beach.)
- 3a. Compaction sampling stations shall be located at 500-foot intervals along the project area. One station shall be at the seaward edge of the dune/bulkhead line (when material is placed in this area); and one station shall be midway between the dune line and the high water line (normal wrack line).

At each station, the cone penetrometer will be pushed to a depth of 6, 12, and 18 inches three times (three replicates). Material may be removed from the hole if necessary to ensure accurate readings of successive levels of sediment. The penetrometer may need to be reset between pushes, especially if sediment layering exists. Layers of highly compact material may lay over less compact layers. Replicates will be located as close to each other as possible, without interacting with the previous hole and/or disturbed sediments. The three replicate compaction values for each depth will be averaged to produce final values for each depth at each station. Reports will include all 18 values for each transect line, and the final 6 averaged compaction values.

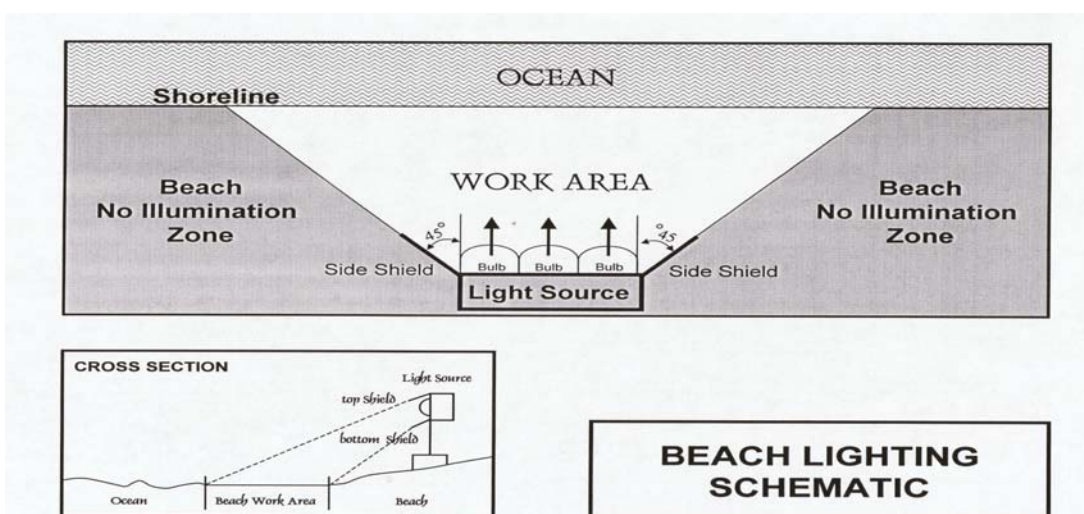
- 3b. If the average value for any depth exceeds 500 pounds per square inch (psi) for any two or more adjacent stations, then that area shall be tilled prior to May 1. If values exceeding 500 psi are distributed throughout the project area, but in no case do those

values exist at two adjacent stations at the same depth, then consultation with the Fish and Wildlife Service will be required to determine if tilling is required. If a few values exceeding 500 psi are randomly present within the project area, tilling will not be required.

4. Visual surveys for escarpments along the project area shall be started immediately upon completion of each section of beach if within the time period May 1 through October 31, and prior to May 1, for 3 subsequent years. Results of the surveys shall be submitted to the Fish and Wildlife Service prior to any action being taken. Escarpments that interfere with sea turtle nesting as determined by the nesting surveyors or that exceed 18 inches in height for a distance of 100 feet shall be leveled to the natural beach contour by May 15. If the project is completed during the sea turtle nesting and hatching season, escarpments may be required to be leveled immediately, while protecting nests that have been relocated or left in place. The Fish and Wildlife Service shall be contacted immediately if subsequent reformation of escarpments that interfere with sea turtle nesting as determined by the nesting surveyors or that exceed 18 inches in height for a distance of 100 feet occurs during the nesting and hatching season to determine the appropriate action to be taken. If it is determined that escarpment leveling is required during the nesting or hatching season, the Fish and Wildlife Service will provide a brief written authorization that describes methods to be used to reduce the likelihood of impacting existing nests. An annual summary of escarpment surveys and actions taken shall be submitted to the Fish and Wildlife Service. To ensure compliance with this condition, turtle nesting surveys shall be conducted for three years following beach restoration. (NOTE: Out-year escarpment monitoring and remediation are not required if placed material no longer remains on the beach.)
5. The Corps shall arrange a meeting between representatives of the contractor, the Service, the Florida Department of Environmental Protection, Bureau of Beaches and Coastal Systems, and the Florida Fish and Wildlife Conservation Commission, Office of Protected Species Management and the permitted person responsible for egg relocation at least 30 days prior to the commencement of work on this project. At least 10 days advance notice shall be provided prior to conducting this meeting. This will provide an opportunity for explanation and/or clarification of the sea turtle protection measures.
6. From May 1 through October 31, staging areas for construction equipment shall be located off the beach to the maximum extent practicable. Night-time storage of construction equipment not in use shall be off the beach to minimize disturbance to sea turtle nesting and hatching activities. In addition, all construction pipes that are placed on the beach shall be located as far landward as possible without compromising the integrity of the existing or reconstructed dune (berm) system. Temporary storage of pipes shall be off the beach to the maximum extent possible. Temporary storage of pipes on the beach shall be in such a

manner so as to impact the least amount of nesting habitat and shall likewise not compromise the integrity of the dune systems (placement of pipes perpendicular to the shoreline is recommended as the method of storage).

7. From May 1 through October 31, direct lighting of the beach and near shore waters shall be limited to the immediate construction area and shall comply with safety requirements. Lighting on offshore or onshore equipment shall be minimized through reduction, shielding, lowering, and appropriate placement to avoid excessive illumination of the waters surface and nesting beach while meeting all Coast Guard, EM 385-1-1, and OSHA requirements. Light intensity of lighting plants shall be reduced to the minimum standard required by OSHA for General Construction areas, in order not to mis-direct sea turtles. Shields shall be affixed to the light housing and be large enough to block light from all lamps from being transmitted outside the construction area (see below schematic).

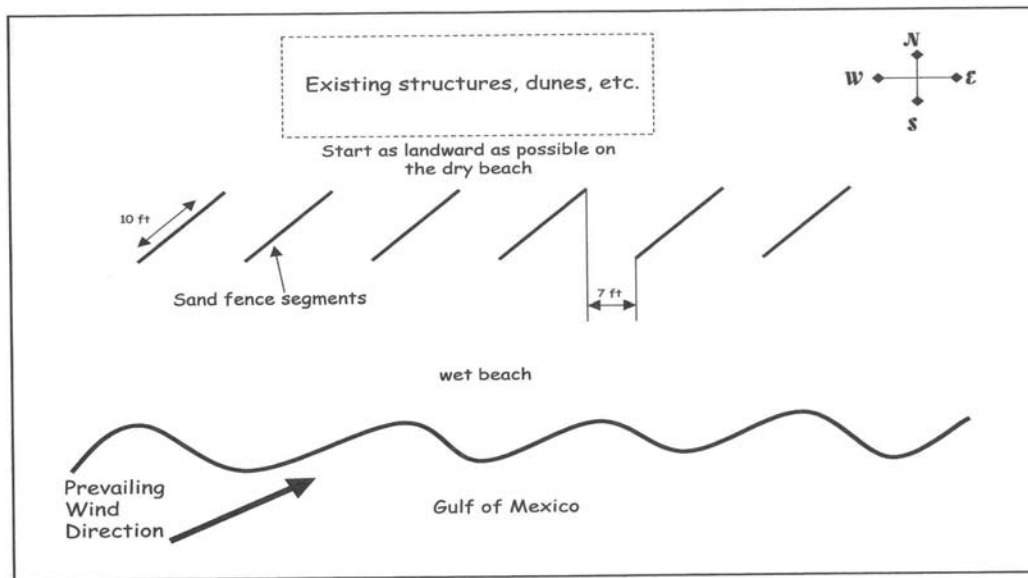


Dune Creation

1. If planting of dune vegetation occurs during the turtle nesting season (May 1 through October 31) the following conditions shall be implemented:
 - 1a. Daily early morning sea turtle nesting surveys will be required during the period from May 1 through October 31. Nest surveys shall only be conducted by personnel with prior experience and training in nest surveys. Surveyors shall have a valid Florida Fish and Wildlife Conservation Commission permit. Nest surveys shall be conducted daily between sunrise and 9 a.m. No dune planting activity will occur until after the daily turtle survey and nest conservation and protection efforts have been completed.

- 1b. Nesting surveys shall be initiated 70 days prior to dune planting activities or by May 1, whichever is later. Nesting surveys shall continue through the end of the project or through September 1, whichever is earlier. Hatching and emerging success monitoring will involve checking nests beyond the completion date of the daily early morning nesting surveys.
- 1c. Any nests deposited in the dune planting area not requiring relocation for conservation purposes shall be left *in situ*. The turtle permit holder shall install an on-beach marker at the nest site and a secondary marker at a point as far landward as possible to assure that future location of the nest will be possible should the on-beach marker be lost. A series of stakes and highly visible survey ribbon or string shall be installed to establish an area of 3 feet radius surrounding the nest. No planting or other activity will occur within this area nor will any activity occur which could result in impacts to the nest. Nest sites shall be inspected daily to assure nest markers remain in place and the nest has not been disturbed by the planting activity.
- 1d. If a nest is disturbed or uncovered during planting activity, the Corps or their contractors shall cease all work and immediately contact the responsible turtle permit holder. If a nest(s) cannot be safely avoided during planting, all activity within the affected project site shall be delayed until hatching and emerging success monitoring of the nest is completed.
- 1e. All dune planting activities shall be conducted during daylight hours only.
- 1f. All dune vegetation shall consist of plant species native to the area and be planted in accordance with Florida Department of Environmental Protection guidelines.
- 1g. No use of heavy equipment (trucks) will occur on the dunes or seaward for planting purposes. A lightweight (ATV type) vehicle, with tire pressures of 10 psi or less may be operated on the beach.
- 1h. All irrigation, if proposed, shall be installed by hand labor or tools and entrenched 1 to 3 inches below grade so as not to pose a barrier to hatchling turtles and to allow for easy removal. The irrigation system shall be designed and maintained so that watering of the adjacent sandy beach does not occur. If a turtle nest is deposited within the newly established planted dune area, the applicant shall modify the irrigation system so that no watering occurs within 10 ft of the nest. Daily inspection of the irrigation system shall be conducted to assure the irrigation system is properly working and meets the above conditions. The irrigation system shall be completely removed once watering is no longer needed or before May 1, of the next year.

2. Any sand fencing or other dune restoration material placed in the project area shall be installed as follows:
 - 2a. A maximum of 10 foot- long spurs of parallel fence spaced at a minimum of 7 feet apart shall be installed on a northeast-southwest (diagonal) alignment (below schematic).



- 2b. All fence material shall be repositioned as necessary to facilitate dune building and shall be removed when 30 percent of the fence is covered with sand.
- 2c. Upon site inspection by the Fish and Wildlife Service, Florida Department of Environmental Protection, Bureau of Beaches and Coastal Systems, or the Florida Fish and Wildlife Conservation Commission, Bureau of Protected Species Management, if it is determined that the fence adversely impacts nesting or hatchling turtles, the fence shall be removed or repositioned as appropriate.

Reporting

1. A report describing the actions taken to implement the terms and conditions of this incidental take statement shall be submitted to the Project Leader, U.S. Fish and Wildlife Service, 1601 Balboa Avenue, Panama City, Florida, 32405, within 60 days of completion of the terms and conditions for each year. This report will include the dates of actual construction activities, names and qualifications of personnel involved in nest surveys and relocation activities, descriptions and locations of self-release beach sites, nest survey and relocation results, and hatching and emerging success of nests.

2. In the event a sea turtle nest is excavated during construction activities, the permitted person responsible for egg relocation for the project shall be notified so the eggs can be moved to a suitable relocation site.
3. Upon locating a sea turtle adult, hatchling, or egg harmed or destroyed as a direct or indirect result of the project, notification shall be made to either the Florida Fish and Wildlife Conservation Commission Stranding and Salvage Network by pager: 1-800-241-4653, ID#274-4867 (make sure you input your area code with your telephone number) or the FWC Division of Law Enforcement at 1-888-404-FWCC; and the U.S. Fish and Wildlife Service Office located in Panama City, Florida at (850) 769-0552. Care should be taken in handling injured turtles or eggs to ensure effective treatment or disposition, and in handling dead specimens to preserve biological materials in the best possible state for later analysis.

The Service believes that incidental take will be limited to the 2,500 feet of beach that has been identified for beach restoration. This accounts for 0.04 percent of the current 1,400 miles of sea turtle nesting beaches in the U.S. The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize incidental take that might otherwise result from the proposed action. With implementation of these measures, the Service believes that no more than the following levels and types of incidental take will result from the proposed project: (1) destruction of all sea turtle nests that may be constructed and eggs that may be deposited and missed by a nest survey and egg relocation program within the boundaries of the proposed project; (2) destruction of all sea turtle nests deposited during the period when a nest survey and egg relocation program is not required to be in place within the boundaries of the proposed project; (3) reduced hatching success due to egg mortality during relocation and adverse conditions at the relocation site; (4) harassment in the form of disturbing or interfering with female turtles attempting to nest within the construction area or on adjacent project and non-project beaches; (5) misdirection of hatchling turtles on adjacent project and non-project beaches as they emerge from the nest and crawl to the water; (6) behavior modification of nesting females due to escarpment formation within the project area during a nesting season, resulting in false crawls or situations where they choose marginal or unsuitable nesting areas to deposit eggs; and (7) destruction of all nests as a result of escarpment leveling within a nesting season when such leveling has been approved by the Fish and Wildlife Service. We anticipate take to be: one loggerhead sea turtle nest annually, one green sea turtle nest biennially, and one leatherback sea turtle nest annually.

If, during the course of the action, this level of incidental take is exceeded, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measures provided. The Corps shall immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Endangered Species Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. We encourage the Corps to meet with the Service to discuss conservation of sea turtles and ways that they could help contribute to their recovery.

1. Construction activities for this project and similar future projects should be planned to take place outside the main part of the sea turtle nesting and hatching season.
2. Franklin County should ensure that the beachfront lighting ordinance is adequately enforced on Alligator Point.
3. The Corps should coordinate with the FWC concerning the project implementation and shorebird nesting on Alligator Point.
4. To increase public awareness about sea turtles, informational signs should be placed at beach access points where appropriate. The signs should describe the importance of the beach to sea turtles and/or the life history of sea turtle species that nest in the area.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

If you have any questions regarding biological opinion, please contact Ms. Lorna Patrick at ext. 229.

Sincerely yours,

Gail A. Carmody
Project Leader

cc:

FWS, Jacksonville, FL (Sandy MacPherson)(w/ copy of PN)

NMFS, Protected Species, St. Pete., FL

FWC, Non-game program, Panama City, FL (Karen Lamonte)

FWC, Bureau of Protected Species Mgt., Tallahassee, FL (Robbin Trindell)

FDEP, Office of Beaches and Coastal Systems, Tallahassee, FL (Jamie Christoff)

Vicki Barnett, Alligator Point Turtle Watch, Alligator Point, FL

Panama City FO:L.Patrick:lap:bs:05-10-04:850-769-0552x229:c:lorna1\T&E\Seaturtle\Franklin County\Alligator Point beach restoration final BO.doc

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